MINING WORLD

MARCH, 1951

VOL. 13 No. 3

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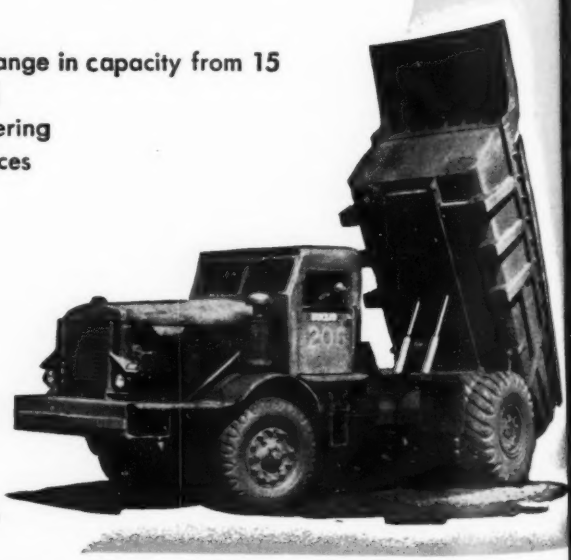

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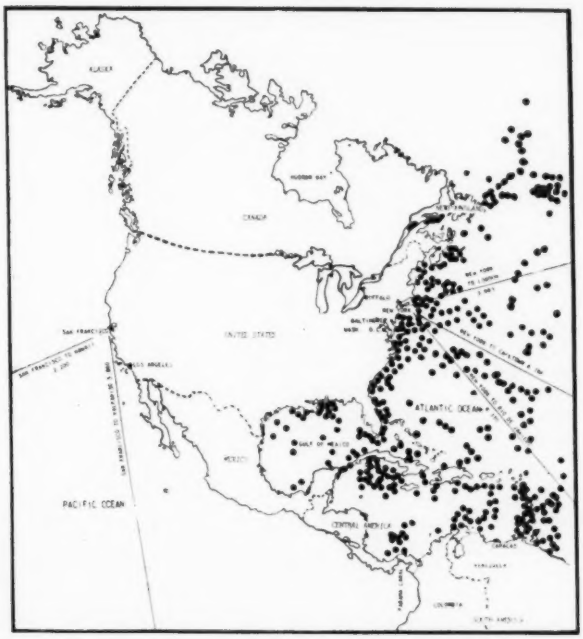
DRIFTS AND CROSSCUTS

Lest We Forget

Each black dot on the map reproduced below records the approximate location of a merchant ship sunk by German submarines during a six-month period of World War II. Many of these ships carried metals and minerals vital to the war effort. Tin from Bolivia, bauxite from Surinam, and copper from Chile to name only a few.

Germany, bordered only by interconnected seas joining the Atlantic Ocean, had no easy access to the Pacific coast of the United States and there were no sinkings along that coast by German-based submarines.

However, today Russian submarines, presumably based in Siberia, have been reported in many places



along the Pacific coast. These submarines prowl the coast to take water temperatures and record sonar (underwater sound) conditions. Reports also indicate that the Russians have a larger, active under-sea fleet than the United States and that they are building many midget submarines incorporating the latest technological discoveries.

The U. S. Navy is rushing completion of an atomic-powered submarine as a counter weapon but its successful completion and operation is several years away.

Mineral deposits must be developed in the United States to make leaner hunting of our merchant ships by Russian sub packs.

COMING CONVENTIONS

March 19 through 23, 1951. METAL CONGRESS & EXPOSITION, Oakland Civic Auditorium, Oakland, California.

April 30 through May 4, 1951. NATIONAL MATERIALS HANDLING EXPOSITION, International Amphitheatre, Chicago, Illinois.

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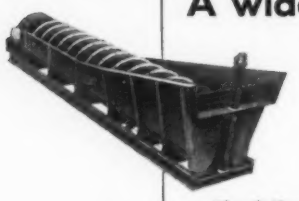

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5 POOL DEPTH	HIGH WEIR SERIES "90" · STANDARD WEIR SERIES "125" · SUBMERGED SPIRAL SERIES "150"	Generally Series 90 is used for 48 mesh and coarser separations, Series 125 for 48 mesh to 150, and Series 150 for 100 to 325 mesh separation.
6 ASSEMBLIES	SIMPLEX · DUPLEX	Duplex units give nearly double the capacity of simplex units, but require less floor space than two separate units.
7 LIFTING DEVICE	HYDRAULIC, MANUAL · HYDRAULIC, MOTORIZED · SCREW, MANUAL	Smooth, powerful hydraulic action is usually preferred to the older style screw lift.

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HELP OR FETTERS?

That the United States is in one devil of a fix is a fact that no one can truthfully deny. That among all the industries in the United States the mining industry is most immediately affected by the condition cannot be disputed. A full production from all the mines is the primary objective and necessity in a fully mobilized economy for defense. The first thought in Washington has been to organize at once a large number of regulating commissions. The question of the day is, "Will they help or hinder?"

The question is not new, for Thomas Jefferson said, "No government can continue good but in the control of the people.

"An elected despotism was not the government we fought for, but one which should not only be founded on true free principles, but in which the powers of government should be so divided and balanced among general bodies of magistracy that no one could transcend their legal limits without effectually being checked by the others." This has been true in our regular governing bodies, but these new regulating boards are a newer element in government in that they have the power to issue directives that have the full force of duly enacted legislation.

Daniel Webster must have foreseen such a new development when he wrote, "It is hardly too strong to say that the Constitution was made to guard the people against the dangers of good intentions, real or pretended. . . . There are men in all ages who mean to exercise power usefully—but they mean to exercise it. They mean to govern well—but they mean to govern; they promise to be good masters—but they mean to be masters. They think they need but little restraint upon themselves. Their notion of the public interest is apt to be closely connected with their own exercise of authority. They may not, indeed, understand their own motives. The love of power may sink too deep in their own hearts even for their own security, and may pass with themselves for mere patriotism and benevolence."

As newspapers and radio have carried reports of Washington confusion in this new outbreak of alphabetical hash we have wondered if we again would have the pleasure of meeting the metal expert who suggested that the shoes of the work-horses be taken off at night in order to rest the horses' feet and conserve iron, or that equally famous livestock advisor who recommended that an impatient borrower postpone lambing season.

Seriously, the metal mining industry, labor and management alike, is proud of the fact that, even under adverse conditions, it has not failed to supply the basic materials that have enabled America to become the arsenal of democracy. We have not failed even when we were the first to fight off the nastiness of the minions of Moscow. We did this because we knew of Lenin's forecast in 1921, and Stalin's repeat, that the fight for communism would be won on the plains of Asia where the present activity is merely a part of their major plan.

In order to point up the seriousness of the present condition let us read again the statement made by Lenin March 18, 1919:

"We are living not merely in a state but in a system of states, and the existence of the Soviet Republic side by side with imperialist states for a long time is unthinkable. One or the other must triumph in the end. And before this end supervenes, a series of frightful collisions between the Soviet and the bourgeois states will be inevitable."

'The Wanderer

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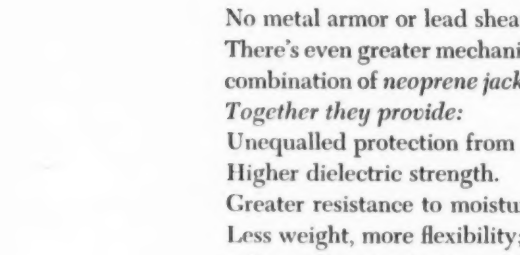

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"DO" PRIORITY FOR MINES SEEN ESSENTIAL TO UP METAL OUTPUT

Members of the Mining Machinery Advisory Committee met in Washington late in January with officials of the Defense Minerals Administration and the Defense Solid Fuels Administration. The problem of providing sufficient machinery, equipment and repair parts for maintaining and expanding production of essential minerals, nonmetallic minerals and solid fuels was discussed.

Industry representatives told of increasing difficulties in obtaining steel and copper, and nickel alloys, not only for new machinery but for repair parts for machinery already in service. The desirability of setting up a specific allocation of various metals for mining machinery and equipment was suggested.

DMA and DSFA representatives pointed out that a program of the requirements for the maintenance, repairs and operating supplies of the mines, and for the manufacture of mining machinery and repair parts has been presented to the Defense Production Administration for appropriate action. In the meantime, the industry is being assisted in meeting its most critical problems on a case-by-case basis, especially where shortage or lack of equipment and machinery threatens to force the closing of mines producing strategic mineral products.

• Small Defense Plants Corporation Proposed

There is a very strong move afoot in Congress to set up an agency similar to the Smaller War Plants Corporation which was sponsored during the last war by Senator James E. Murray of Montana and which, after the war, was liquidated by the RFC. As a result Senator Sparkman of Alabama and Representative Patman of Texas are sponsoring a new bill to set up a Small Defense Plants Corporation to watch out for the welfare of the small business man and manufacturer.

Naturally, the government procurement officers want to do business on a large scale with large, well-established corporations and to overload them with orders while open capacity exists around the country in small plants with which the procurement officers find it a nuisance to deal. This fact became so well established early in World War II that the Smaller War Plants Corporation, a government agency, was empowered to take prime contracts from the government and sublet them to small concerns. In general, it functioned quite satisfactorily and through its efforts many a concern prospered which otherwise would have gone under.

When Congress was trying to renew the premium price plan in 1947-8-9, against the stubborn opposition of the Interior Department, Commerce Department, Bureau of the Budget and other agencies, and insisted on substituting for this automatic system of incentive payments the individual contract system now in operation, the experiences with government contracts in the past, and the natural tendency to deal with large companies, was brought to the attention of the representatives of the agencies. However, as they (and Interior especially) had little or no experience with such matters, which were strictly WPB, RFC, and SWPC functions, the pleas of the congressional committees went unheeded. Because of this we seem to be headed for the very type of confusion that had been predicted.

• No Over-Market Contracts Issued

In the field of copper, lead and zinc, General Services Administration is negotiating no contracts at prices above the open market, either for foreign or domestic metal. Contracts will be made with producers who can operate at prices below the market and a floor price will be written in which will allow a profit and amortization should prices recede below the level at which the mine could normally operate. The matter of labor escalator clauses has not been explored thoroughly at the policy levels.

• RFC Plays Part In Loan Picture

Regulation 601.16 to Section 302 of the Defense Production Act was explained by J. Stuart Symington in a letter. He wrote:

"That section grants authority to provide financial assistance only to the extent that such assistance is not otherwise available on reasonable terms. This limitation in effect stipulates that a prerequisite to obtaining financial assistance under Section 302 is that it must be demonstrated that such assistance was not obtainable at reasonable terms from the usual sources of credit, including the Reconstruction Finance Corporation.

"This provision in no way hampers or delays the granting of a defense production loan. Inasmuch as the RFC is the fiscal agent for Section 302 loans, a working arrangement has been set up by the loan certifying agencies and the RFC. Under this arrangement all applications for Section 302 loans are examined by the RFC to ascertain whether any portion of the loan can be handled by it under its statutory lending powers. On the other hand, applications for loans to the RFC, when for some reason they cannot be handled in whole or in part by that agency, are referred to the certifying agencies for 302 loans to ascertain whether a 302 loan can be granted."

Symington's statement raises the interesting speculation as to whether, then, it might not be better to apply direct to RFC in the first place.

• DPA Creates Changes In Authority

Because of the establishment of the Defense Production Administration, several major changes in policy and lines of authority have come about between the Office of Defense Mobilization and the war agencies within the permanent agencies. For example:

Certificates authorizing RFC loans under the plant expansion provisions of the Defense Production Act will now be issued by DPA. The agencies which previously issued these certificates will, however, continue to make recommendations relating to the loans. Thus the Interior Department will make recommendations concerning the expansion of mining facilities.

The DPA, rather than the National Security Resources Board, will issue tax amortization certificates permitting accelerated write-offs of the cost of new plant facilities. Recommendations will be made to DPA by the other agencies.

A sustained program of [illegible] development prior to Korea, in anticipation of an eventual improvement in prices, placed Ima in a springboard position when tungsten demand soared. This photo provides an excellent view of a stope on the Zero level which follows a vein dipping 25 to 30° to the southeast. Miners Martin Urest, Ray Strickland and Joe Freed are standing in a portion of the stope where pillars were left more frequently than usual. On the 150 level drifting is being conducted on a nearly vertical vein nearly 16 feet wide, four feet beyond either side of the 8 by 8 foot drift.

Ima Tungsten -- Pre-Korean Development Proves Boon to Preparedness Drive

Bradley Mining Co. follows tungsten, it follows rare-metal deposits, and it does not care how inaccessible the property is—Bradley has a way of conquering mountains and terrain.

The Ima property, with its tungsten mine and new 150-ton mill, is a good example of a Bradley operation. Ima lies some 26 miles east of U.S. Highway 93 across rough roads in a spot in Idaho that is serviced by neither railways nor electricity.

Today, the mine is producing at a daily rate of approximately 150 tons of hard, quartz-hubnerite ore which contains an average of 0.5 to 0.6 percent (varying from 0.4 to 1.5 percent) of WO_3. The new mill, replacing the mill which burned in December of 1947, went into operation in December of 1948. Though the new mill uses essentially the same flowsheet as the former mill, the grinding and crushing sections have been completely redesigned to minimize overgrinding, the mill has been modernized, and material-handling has been simplified.

Geology & Metallurgy

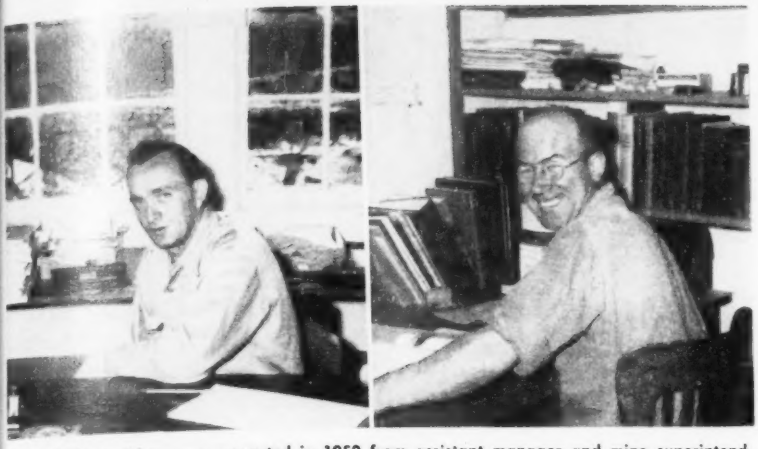
From a geological point of view, the Ima mine is a complex puzzle. Consulting geologist Carlton D. Hulin, who has studied the geology of many mining areas throughout the world, says, "The Ima mine is one of the toughest mining-geology problems in the world." In the mine, ore is extracted from steeply dipping veins by slice and slot stopes, and from flatly dipping veins by open-stull stopes. From a metallurgical point of view, the Ima mill is relatively simple—a combination of jigging, flotation, tabling, and magnetic separation produces the final products.

Tungsten is probably the most important constituent of high-speed cutting steels—steels which by staying sharp longer and by allowing faster cutting have caused a five-fold increase in industrial machine production in less than fifteen years. The tungsten metal contained in the concentrates from Ima mine represent an important part (5 to 10 percent) of the United States' tungsten-mining potential. The Ima property is one of the few domestic mining operations which continued to produce tungsten at a loss during the period of low prices and slack demand of recent years. As a result of this situation, Ima is now ready to expand to peak production with a sound, well-maintained mine.

Six Years Under Bradley

For more than half a century, Bradley has been a great name in North American mining. The Bradley Mining Co. is administered by three sons of the late Frederick Worthen Bradley, Worthen, who is president; John, who is executive vice president; and James, who is vice president.

Seen below is the new 150-ton Ima concentrator, built by the Western-Knapp Division of Wemco in 1948 following the fire which destroyed the old mill in December of 1947. The small bridge at the right leads from the mill to the tailings flume on the opposite side of Patterson canyon.



LEFT—Charles Hathhorn was promoted in 1950 from assistant manager and mine superintendent to his new position of manager of Ima Mines. He is a qualified airplane pilot, an important mode of transportation at Bradley properties. RIGHT—Mill Superintendent at Ima is John S. Anderson who, like many mill men, received his basic education as a mining engineer.

On January 10, 1945, the Bradley Mining Co. acquired, under a lease agreement with an option to purchase, the two large groups of claims which constitute the Ima mine; one of these groups is owned by Ima Mines Corporation, the other by Tungsten Mining Corporation.

The existing mill was remodeled in July of 1945 from flotation of hubnerite to the present circuit in which sulfide impurities are floated, and hubnerite and scheelite are recovered by gravity means and then separated magnetically. When the remodeled mill burned in December of 1947, mine crews were shifted to development, exploration, and general mine improvement. Western-Knapp Engineering Division of Western Machinery Company, San Francisco, California, was engaged to design and build a new 150-ton mill in June of 1948. In December of 1948, the new mill, costing approximately $200,000 was completed. Ima resumed production at a reduced rate, awaiting an increase in the demand for tungsten.

Heavily Faulted Quartz Veins

Contorted and metamorphosed quartzites, presumably belonging to the pre-Cambrian Belt series, intruded by dikes, tongues, and stock-like bodies of granite, form the country rock of the Ima mine. The ore occurs generally as small crystals and grains of hubnerite in milky-white quartz veins varying in width from 2 to 20 feet (20 feet is about the maximum true width) striking N 55° to 85° W, and dipping at various degrees to either the southwest or northeast. In addition to hubnerite and a small amount of scheelite, the quartz veins carry varying amounts of silver-bearing tetrahedrite, galena, chalcopyrite, sphalerite, molybdenite, and pyrite, and some fluorite and rhodochrosite.

The Belt quartzites, intrusive granites, and quartz veins are all cut by several systems of faults. These faults, apparently active before, during and after mineralization, have offset the veins at frequent intervals. Though more than 15 productive veins have been found, mining now centers largely around five veins. As a result of the geological complexity, the problems of following veins, of predicting the location of veins, and even of determining the continuity of veins are extremely difficult. Accurate geologic mapping has definitely "paid off" and in his head, Manager Charles Hathhorn, who plans and schedules mine development, has a remarkably complete picture of the complex Ima vein and fault systems.

Developed by Two Adits

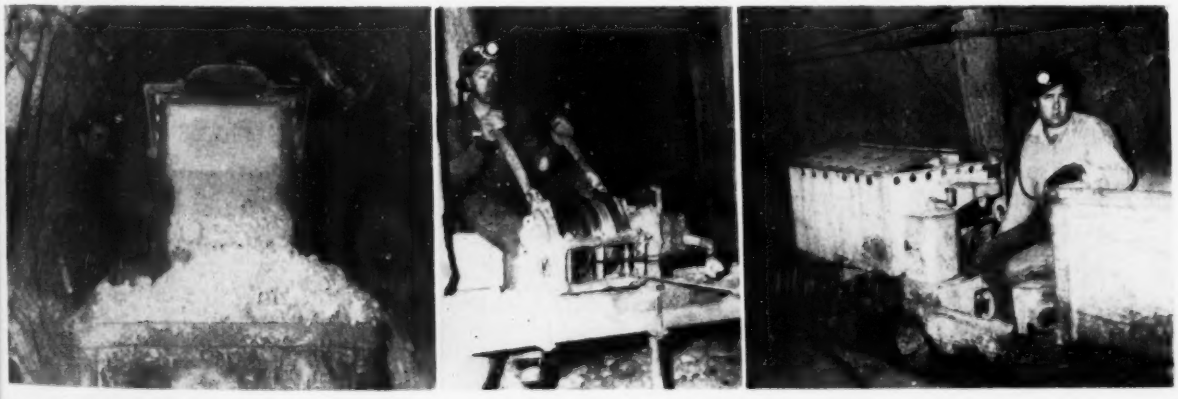
One of the main operating levels of the Ima mine is the Zero level, an adit which follows the center of the vein system for 3,000 feet. The 360 level, a shorter level at the same elevation as the crushing plant (downhill from the Zero), is wet and hard to maintain; it is used for haulage of ore to the mill. The 360 is a key link in mine production and is being developed further in conjunction with new workings. There are roughly seven miles of horizontal workings in the mine.

The general plan of development for mining is to drive main-haulage levels in a strikewise direction at less than 100-foot vertical intervals, to drive crosscuts to the veins, to drive extraction drifts along each vein, and to drive raises to the next level at 100-foot intervals or as needed along the extraction drifts.

Explored by Drilling

From the levels, miners explore newly opened country by diamond and long-hole drilling to map accurately the vein structure and geology. Cores from the Sullivan HS-

LEFT—Miner Wendell Johnson operates a G-D9 mucking machine to fill a one-ton Card Z-18 end-dump turntable-type car. This 6 by 7 foot untimbered drift on the 150 level is piercing a granite sill at this point. CENTER—Ore is drawn from stopes via ramps in some areas, as seen in this photo of Miner Al McCoy operating a Joy 5211 double-drum hoist working with 30-inch scraper. RIGHT—Mancha "Little-Trammer" locomotives powered by Edison C-6 40-cell units are employed on each mine level. Motorman in this illustration is Dan Nicholson.

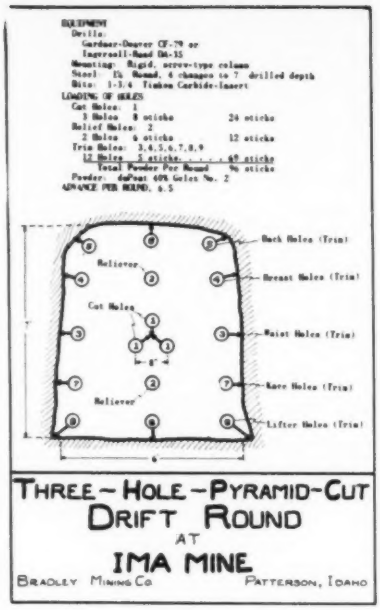


15 high-speed diamond drill, which is usually column-mounted, are assayed and logged. Long-hole drilling with a column-mounted Ingersoll-Rand DA-35 drifter provides the final close-up picture in places where diamond-drill data are sparse or contradictory; jointed steel rods, allowing hole depths up to 35 feet, are tipped by Timken 1¾-inch carbide-insert bits.

In drilling the three-hole pyramid-cut drift round (see cut), or a similar five-hole, burned-cut round for harder rock, two Gardner-Denver CF-79 drifters and six Ingersoll-Rand DA-35's put in seven-foot holes using four changes of 1¼-inch round steel; drifters are mounted on screw-type columns. Ingersoll-Rand R-58 stopers and Gardner-Denver R-104's, if used for driving drifts, are mounted on air bars. Miners pick up the broken rock with Gardner-Denver GD-9 and Eimco No. 12B mucking machines. Drifting crews maintain a cycle of operations: for instance, one three-man crew driving a 6 by 7 foot, untimbered drift through quartzite and granite used a reverse-feed R-58 mounted on an air bar, used three steel changes to a drilled depth of six feet, and maintained an average advance of 5.5 feet (round in and round out each shift).

Three Stoping Systems

Depending upon whether veins are flat-lying or steeply dipping,



wide or narrow, one of these three mining systems is usually used: Flat-lying veins (dipping less than 45°) are mined by open stopes in which pillars are left for support. Steeply dipping wide veins (two or three sets in width) are mined by square-set slot stopes similar to those developed at Butte, Montana, by Anaconda Copper Mining Company. Steeply dipping narrow veins (less than two sets in width) are mined by square-set slice stopes.

In typical, open, flat stopes miners drive slusher drifts up-dip at 30-foot intervals. Pillars, eight feet in diameter, are left every 5000 square feet. Ore from the stopes is scraped to the level below with double drum scraper hoists pulling 30-inch scrapers and is pulled up a ramp so that it dumps directly into haulage cars.

Square-set slot and slice stopes, as used at Ima, are essentially the same method of mining; the slice works a narrow vein for a distance of 20 sets strikewise; the slot works a wider vein for a distance of approximately seven sets strikewise.

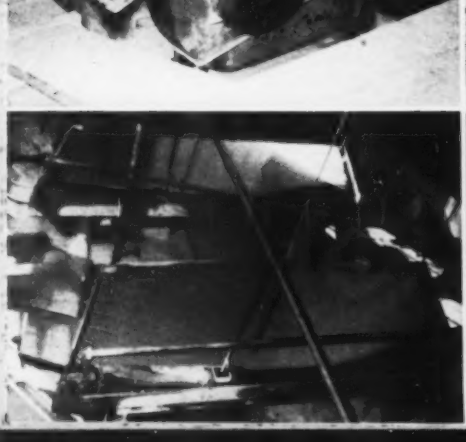
The slot and slice systems were chosen for these two reasons: Rapid upyard mining of stopes which have a limited horizontal area minimizes downward ground movement (keeps the stope small in horizontal area where the ground tends to settle). Hand and machine mucking are minimized; in steep veins (over 50°) broken ore travels by gravity all the way from the face to the mine car, and fill is also by gravity.

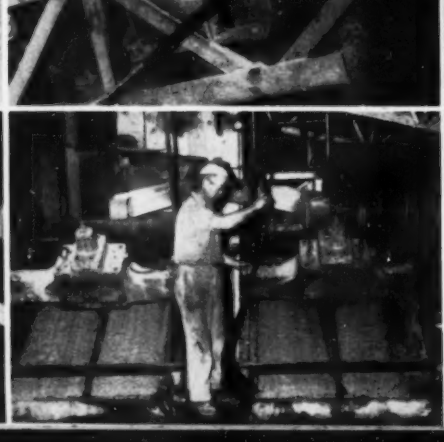
Square-Set Slice Stopes

Typically, a square-set slice stope is developed to mine a narrow, steeply dipping vein. Raises are driven at 100-foot intervals to the level above. The sill is then roomed-out to the full width of the vein, and broken ore is loaded by mucking machine. Ore in the first floor above the drift is then breasted into the drift and picked up by mucking machine. At

TOP, Left—Primary crushing at Ima is handled by this Straub Kue-Ken No. 50, receiving feed from 3 by 6-foot Link-Belt screen. Careful sizing prior to all crushing and grinding is employed to keep overgrinding to a minimum. CENTER—This Link-Belt 18-inch conveyor delivers ore to the 200-ton crushed-ore bin. RIGHT—Marcy 4 by 10 rod mill is used as coarse grinder to produce 84 percent plus 35-mesh product that is scalped by Bendelari jig. Mill is driven thru V-belts by Caterpillar D-13000 Diesel.

BOTTOM, Left—These are two of the six Deister Concentrator No. 6 Diagonal-Deck tables used to extract hubnerite from the minus 32-mesh sulfide-free ore as it comes from flotation. CENTER—Mill Sup't John Anderson adjusts flow of wash water to two Tyler "Hum-mer" 4 by 5-foot screens, which separate scalped jig overflow at 32-mesh, oversize going back to regrind and undersize to conditioning for sulfide flotation. RIGHT—Six 36 by 36 inch "Agitair" cells are employed for removal of pyrite, tetrahedrite, galena, sphalerite and other sulfides. Mill operator G. N. McCall is seen increasing air input to first rougher unit.





25-f t intervals (five sets strike-wis chutes are installed. To bring ore to the chutes from sets bet we chutes, slides are extended fro the chute sides to two sets on eac side; these steep slides rest on the ips of successive sets.

In good ground, where cross-vein pre ures are not excessive, miners wor the stope all the way to the leve above before filling. In bad grou nd, an intermediate level is established 50 feet above the extraction drift. Round stull timbers are installed as grizzly breakers in alternate sets on each floor. No ore is stored in the stopes—motormen pull the chutes at frequent intervals. When all the ore has been drawn from the stope, breaker and temporary timbers are removed, and the entire stope is filled with development waste from the level above.

Round timber, procured locally, is framed in the Ima shops into step-down, cap-butting stope timber; sets are 5 feet 4 inches capwise and girtwise, and are 7 feet 2 inches postwise.

Motormen draw ore from the stopes into C. S. Card Z-18 end-dump turntable-type cars. In all levels above the 360, ore is dumped into a transfer raise which carries it down to the 360. On the 360, ore is drawn again to Z-18 cars and trammed to the crushing plant in strings of eight cars pulled by a Mancha "Little Trammer." Powered by an Edison C-6 40-cell battery unit, the trammer on the 360 level makes a maximum haul of approximately 2000 feet.

Minimize Overgrinding

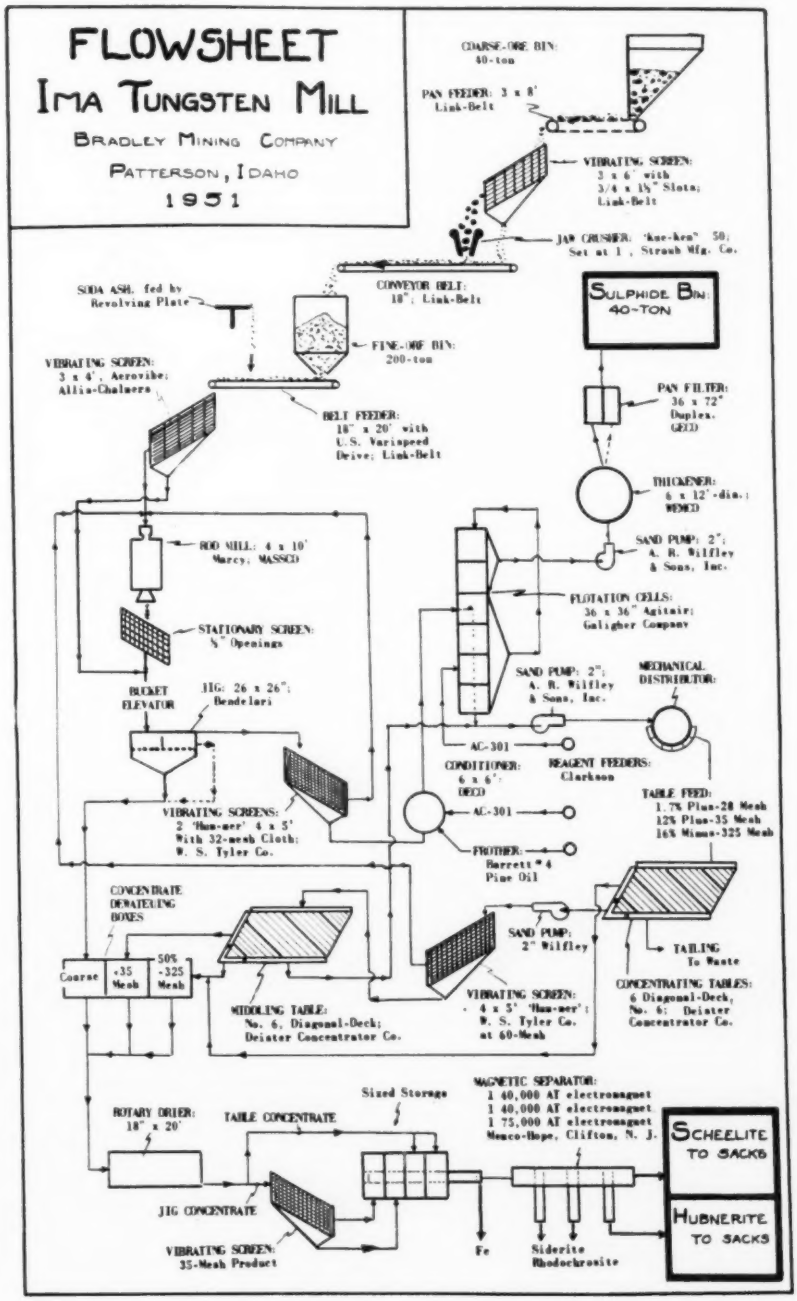
The key problem, and a difficult one, in the Ima mill is prevention of overgrinding. As Mill Superintendent John S. Anderson says, "Our grind is a compromise between a coarse feed to tables and a fine feed to flotation. The balance is weighted in favor of the coarse grind—in favor of the more valuable product, tungsten." Hubnerite (nearly pure $MnWO_4$) is a rather hard, brittle mineral which grinds to minus-325-mesh with a small amount of working. Since nearly all losses of both hubnerite and scheelite are in the minus-325-mesh range, the new mill was designed to minimize fine-grinding effects. These are the specific provisions in the flowsheet (see cut) for prevention of overgrinding:

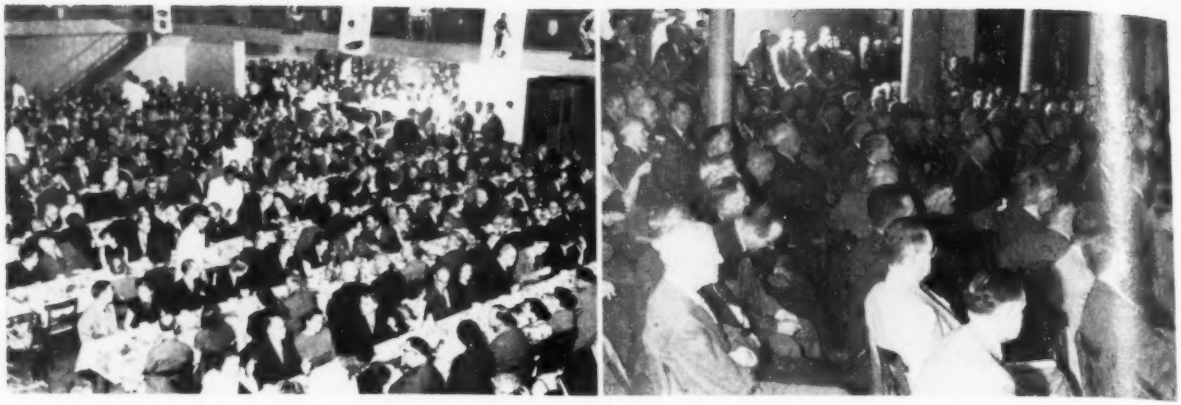
1. Feed to each crushing device, and at the earliest logical point in each circuit, is screened to prevent the crushing or grinding of material that is already sufficiently fine for the next operation.
2. The new Kue-Ken No. 50 primary jaw crusher has been set for a one-inch (finer) product so that the time of rod milling could be shortened.
3. The ball mill, used in the previous circuit, has been replaced by a Marcy 4 by 10 foot rod mill. Two 4 by 5 foot Hummer screens in parallel are used in closed circuit with the rod mill. Sizing is at 32-mesh. Screen cloth is Ludlow-Saylor No. 249 stainless steel. Because it exerts the greatest grinding force on large particles, and because it is rapidly fed, the rod mill produces a much smaller portion of minus-325-mesh-material than did the ball mill.

Concentration in the new mill falls roughly into four steps:

1. Jigging of the rod-mill product ahead of the Hummer screens to recover coarse hubnerite—a 26 by 26 inch Bendelari diaphragm jig (see cut of flowsheet). Hubnerite is later separated magnetically from the scheelite and sulfides also produced by the jig. These rejects join rod mill feed.

Continued on page 81





LEFT: The Gold and Silver Banquet was the featured social and entertainment event of the convention. RIGHT: More than 1,000 of the nation's mineral producers got a first hand report from Washington mineral planners and heard the Honorable Pat McCarran, U.S. Senator from Nevada, say, "We are a nation at war. The mining industry must so built that the enemy dare not approach."

Plans for Greater Reliance on U.S. Mine Output Told at Denver

A history-making change in the national administration's policy regarding domestic mining was announced in Denver, Colorado, during the 54th annual convention of the Colorado Mining Association.

The significant announcement was made by Dr. James Boyd, director of the U. S. Bureau of Mines and of the Defense Minerals Administration, to mineral producers from 37 states, Alaska, and 14 foreign countries. He said that an expression had been received from the highest government level to the effect that first priority on development and production of metals and minerals must be from domestic resources and that the nation would depend on mines in the United States for mineral supplies.

The high level policy was welcomed by representatives of many of the nation's largest mining companies who had long pointed out the necessity for development of domestic mineral deposits.

Government-Industry Sessions

On Saturday, February 3rd, the most important governmental men charged with making and executing plans for the mining industry spoke at the convention. For the first time in history, the metal producers and government planners met and talked person-to-person instead of by the unsatisfactory method of letter and telegraphic communication normally used.

The Honorable Pat McCarran, United States Senator from Nevada, presided at the session. In behalf of the mining industry he asked the planners for reports on the following: What minerals and metals are wanted? Where is the miner to deliver his ore? Where is he paid for his ore? How fast is he paid for his ore? What priorities does he get for purchasing supplies? And how does he secure funds for exploration and development?

The answers to some of these questions were given by spokesmen from the following departments:

General Services Administration

Jess Larson, administrator for the General Services Administration, reported that his agency was directed to buy minerals and ores for the national stockpile. This necessitated weighing, sampling, shipment, storage, and accounting for the stockpiled minerals. He reported that no marginal-production minerals had been stockpiled.

H. A. Montag, chief of the Requirements Division, Defense Minerals Administration, Washington, D.C., came to Denver to inform the mineral producers of plans and progress for a priorities system.

Munitions Board

The Munitions Board, a part of the Department of Defense, was represented by Carl Rolle, technical advisor, and Dr. Timothy C. May, Office of Materials Resources. Rolle outlined the procedures whereby the Department of the Interior determined how much of what was to be stockpiled. The execution of the Munitions Board's program is handled by the General Services Administration. He said that the stockpile goal, in dollars, was now up to $9,000,000,000 and that needs and requirements were increasing more rapidly than acquisitions.

Defense Minerals Administration

H. A. Montag, chief of the Requirements Division of D.M.A., outlined the progress his division has made in its four sections as follows:

Access Roads. The Secretary of the Interior now has authority to certify need for an access road to a producing or new mine through the field engineers of the Public Roads Administration. He reported two roads had been "certified."

Housing. A bill for defense hous-

in the hands of a Congressional Committee.

Manpower. A full time personnel expert has been employed, and the Department of Defense is cooperating with the mining industry in the matter of deferments.

Machinery and Equipment. A revival of the World War II priority (P-56) system is in progress. It will be a rating system, all mines will be serialized and dollar value will not be a basis for priorities.

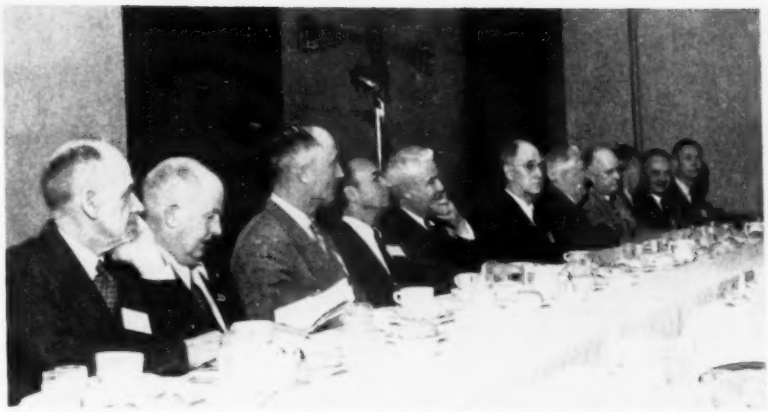
Priorities for Small Mines

Senator McCarran referred to priorities for keeping mines in operation and said, "I hope there will never be another order like L208. —We don't want to close down mines—never to be reopened—L208 did no good."

Robert S. Palmer, executive director of the Colorado Mining Association, posed a question from the floor as follows: "Regarding the new P56. Will small miners be given the same treatment and consideration as large mines?" Montag's reply was that the size of the mine made no difference. "The criterion would be the essentiality of the ore."

DMA Progress

Dr. James Boyd, director of the DMA, reported that government plus industry must develop as a team to strengthen our economy to keep the United States' position in the world. Existing mines must be kept in full production, exploration and development of new reserves must be accelerated and known reserves must be produced when needed. He reported the changing and newly developed needs for minerals was a serious problem and that Otto Herres, vice president of the Combined Metals Reduction Company and chief of the Zinc-Lead section of DMA, was doing a superb job in determining what the needs would be.



At the speakers table and the Gold Luncheon were the distinguished guests, from left to right, Harvey Matthews, vice president, Stearns-Roger Manufacturing Company, Denver, Colorado; Blair Burwell, president of the Colorado Mining Association, Grand Junction; LeRoy Giles, manager, Divie Gold Mine, Idaho Springs, Colorado; Donald L. Kemmerer, Economist, University of Illinois, Champaign; Harold Worcester, assistant general manager, Golden Cycle Corporation, Cripple Creek, Colorado; Frank Lilley, Spokane, Washington; Honorable Patrick McCarran, United States Senator from Nevada; James White, National Minerals Advisory Council, Washington, D.C.; Dr. V. P. Sokoloff, Johns Hopkins University, Baltimore, Maryland; and Robert S. Palmer, executive secretary, Colorado Mining Association, Denver.

Plans are still being formulated for exploration and development loans, and such a program has to go through the Defense Production Authority for policy and funds, he added.

Metal Needs

The present combined needs for defense production and civilian requirements of ferro alloys are much larger than during peace time, according to Dr. Boyd. This is particularly true of columbium and, to a lesser extent, of chromium, cobalt, tungsten, molybdenum and vanadium.

Ore Purchase Depots

The General Services Administration has plans for the establishment and opening of ore-purchasing depots "within a few weeks," Dr. Boyd reported. The first depots will be located in northern California and southern Oregon for the purchase of chromite. Similar depots for the purchase of manganese in Montana and New Mexico will be opened. Tungsten ore-buying depots will also be established in Nevada, California and Boulder County, Colorado.

AEC Reports Progress & Plans

In making his annual report to the nation's uranium miners, who again had assembled in Denver, Frank H MacPherson, manager, Colorado Raw Materials Office, AEC, reported important progress in 1950 and major plans for 1951. Progress during 1950 resulted in "domestic uranium ore production exceeding production of any previous year and it is expected that 1951 will show a still greater production," he said.

The Marysvale, Utah, uranium deposits described by MINING WORLD in the July, 1950, issue are growing in importance. MacPherson said that "several ore lots shipped to the Marysvale buying station recently have assayed over 1.00 percent U_3O_8."

Plans for 1951 call for expanded exploration and diamond core drilling, continued metallurgical research

LEFT: Jess Larson, Administrator, General Services Administration, Washington, D.C., came from Washington for a field report and to meet miners interested in the sale of mineral to his governmental buying agency. CENTER: Frank H. Wardlaw, Jr., manager, International Smelting & Refining Company, Salt Lake City, Utah, was again the toastmaster at the Gold and Silver Banquet. RIGHT: Honorable Clair Engle, Congressman from California, is shown as he addressed the Sowbelly dinner.

LEFT: Zinc producers get together during the convention. They are, R. A. Young, vice president, American Zinc Company of Illinois, Dumas, Texas; and W. L. Jude, superintendent of the Empire Zinc Division of the New Jersey Zinc Company, Gilman, Colorado. RIGHT: V. L. Mattson, director, Colorado School of Mines Research Foundation, and H. G. Fisk, Natural Resources Institute, University of Wyoming, discuss progress in metallurgical research during 1950.

on low uranium and copper-uranium ores and purchase of uranium concentrates from any new mills operated by private companies.

Mineral Future Section

Edward H. Snyder, president of the Combined Metals Reduction Company and the American Zinc Institute, Salt Lake City, Utah, was the presiding chairman of this section. Mr. Snyder asked prominent operators from various mining districts to review operations in their respective districts and forecast possible increases in metal output if given a price incentive.

Robert L. Jones, manager of the Jones & Nylene Mining Company of Leadville, Colorado, reported that he was a small mine operator who depended on precious metal value of his ore to carry production expenses. However, his mine had a lot of sub-marginal zinc ore developed and with a four cent per pound bonus for zinc that production could readily be tripled.

James H. Buchanan, vice president of the Nellie B. Mining Company, Picher, Oklahoma, said that the Tri-State district was again ready to produce metal for national defense. Necessary mine, mill and plant facilities were available, and manpower and a high degree of mechanization could increase metal output 40,000 to 60,000 tons per year if an additional price of five cents per pound over current metal prices could be guaranteed.

William E. Haldane, LEFT, newly elected president of the Independent Uranium-Vanadium Producers Association, outlines steel requirements of the uranium miners to Dick Scott of the Colorado Fuel & Iron Corporation.

Joseph Taylor, vice president of the Peru Mining Company, Silver City, New Mexico, said that production of zinc in New Mexico can be increased as much as 50 percent, at a price. At least 15 small mines in the Silver City district would be able to resume operations if zinc was needed as badly as some had reported.

Cecil Fitch, Jr., vice president and general manager of the Chief Consolidated Mining Company, Eureka, Utah, reported on the operations of companies' mines. He described his company as a typical independent mining company which was operating at maximum capacity but whose production would decline because development work was three years behind normal requirements.

Increased Uranium Reserves

In describing *Uranium Exploration*, Thomas W. Oster, acting chief, Colorado Exploration Branch of the Atomic Energy Commission, said. "One of the outstanding accomplishments during recent years is the realization that our search for uranium should not be limited by previously conceived ideas of where the boundaries of uranium (carnotite) mineralization are located."

Guided by this principle and with a government-guaranteed price and market for carnotite and roscoelite ores, the prospectors, geologists and mine operators have greatly extended the known mineralized area of the Colorado Plateau and have increased both reserves and production of uranium. Some of the most important extensions have been made on the south and southwest periphery of the well-known Plateau.

LEFT: William G. Haldane, treasurer of Minerals Engineering Company, Grand Junction, Colorado, reports on metallurgical trends in uranium recovery. CENTER: Cato Sells, full-blooded Navajo Indian and former member of the Tribal Council, Farmington, New Mexico, urged that a uranium recovery plant be erected on the Reservation to handle increased tonnages of ore mined there. RIGHT: Frank MacPherson, Colorado operations manager (with headquarters at Grand Junction) of the New York Raw Materials Office, AEC, gives his annual report on uranium developments and future plans.

Grants Uranium

In discussing the Grants, New Mexico, uranium deposits, first reported in MINING WORLD in November 1950, Oster said, "the known mineralized area has been extended some 25 miles along the main Santa Fe Railroad line and along U. S. Highway No. 66.

"The area is easily prospected, and mining will be economical. It also appears that, contrary to first guesses, the ore is exceptionally amenable to beneficiation." The copper-uranium deposits of the southwest are of growing economic importance, "and over 150 mining claims have been staked in the White Canyon district, San Juan County, Utah, in recent weeks," he said.

Fluorspar Needs Growing

A review of recent developments in the fluorspar industry was presented by C. O. Anderson, vice president, Ozark-Mahoning Company, Tulsa, Oklahoma, in his paper on *Fluorspar an Essential Mineral.*

There can be no question of the importance of fluorspar and its record consumption in 1950. Everything points to its growing importance in the future. Anderson said, "In 1950 the United States was not presumably producing for a war effort, and hence, as we get ready for 1951 and future years, a tough question is, 'What will this consumption figure become?' " He gave a partial answer as follows: The expanding steel industry could need 10 percent more metallurgical grade fluorspar, or 24,000 tons per year. Reactivation of high-octane aviation-gasoline plants could account for 20,000 tons of acid-grade fluorspar annually. Other increasing uses could be: atomic energy, fluoridation of municipal water supplies and inauguration of a federal stockpiling program —long advocated by industry.

Domestic production has been increased by improvements in metallurgy but in the final analysis, Anderson stated, "To meet the obligations that appear to be confronting the industry, higher prices must come to get out the fluorspar and try to get the job done, and even at that, substantial time and effort will be required."

The Lead Situation

Felix Edgar Wormser, vice president of the St. Joseph Lead Company, reported on the two-price system for lead which set a 17 cents per pound price for domestic lead and 18.5 cents for foreign lead. This situation is due to the "voluntary" price control imposed by the government. Needless to say, the domestic producer is greatly disturbed to see foreign lead sold in the domestic market at a higher price than he receives.

The demands for lead have continued to increase because of its versatility in replacing in many cases aluminum, titanium, copper, zinc and tin, now harder to obtain.

Section 3(B) of SEC Act

Baldwin B. Bane, director of the Securities and Exchange Commission, Washington, D.C., reported that, under the modified section of the SEC Act which in May, 1945, raised from $100,000 to $300,000 the registration exemption of securities with the Commission, real progress in mine financing had been made. In outlining this progress, Bane reported, "From May, 1945, to December 31, 1950, there have been about 934 filings involving domestic mining companies, excluding coal companies, and involving an offering of over $100,000,000 under the regulation." In the year just ended "there were 162 such filings involving an offering of over $16,000,000. And these almost wholly were offerings of small mining companies."

Outproduce the Enemy

Robert S. Palmer, executive director of the Colorado Mining Association, in opening the convention said, "It is our sincere hope that the convention will emphasize the importance of the domestic mining industry to the economy of the nation —our economy will survive the onslaughts of Communism only so long as we continue to produce more new wealth than we consume within our borders."

When the convention closed three days, and some 50 papers, meetings and discussions later, there was no doubt of the resolution and determination of the more than 2,000 mine operators—metal and mineral producers—to outproduce the Communistic enemy.

COLORADO MINING ASSOCIATION RESOLUTIONS

The United States cannot depend upon the tender mercies of foreign metal cartels and trusts in time of peace, nor to submarine-infested sea lanes in time of war. Closed domestic mines must be reopened immediately. New mines must be found and developed to meet increasing demands for metals, and the metal miner must be given adequate returns for his products.

To this end the following resolutions were adopted by the 54th Annual Meeting of the Colorado Mining Association:

1. We strenuously urge that the federal government establish base prices for copper, lead, zinc, tungsten and other base metals and minerals, sufficient to pay the metal miner for his cost of development and operation, and to provide a fair return on his investment; and that such prices be guaranteed for a period of not less than five years, the same as is now done with a few specific mining projects. We further urge that the federal government establish strategically located stockpiling centers where the small miner may sell strategic ores.

2. We strongly advocate a liberal policy of loans and official encouragement for the construction of mills to provide markets for small miners in strategically located areas.

3. We advocate an increased program of governmental loans to and government co-operation with mining enterprises for exploring, core drilling and the conducting of geological field work to aid the miner in locating new ore bodies.

4. We urge that the price now paid by the federal government to producers of uranium ores be raised to meet increased costs of production and provide an equitable return on invested monies.

5. Metal miners are vitally essential to the national defense. We urge that all men of any age engaged in metal mining be deferred from military service.

6. We advocate the prompt allocation of sufficient steel and other materials and explosives for the development and operation of our metal mines without unnecessary red tape.

7. We strongly condemn any revisions in the present United States mining laws, particularly those proposed by the Bureau of Land Management of the Department of the Interior.

8. We insist upon the immediate repeal of those portions of the monetary laws of the United States which prevent United States citizens from exercising their natural and constitutional right to purchase, own and sell all forms of gold.

9. We emphatically condemn any attempt to discontinue the purchase of silver by the federal government for monetary purposes, and we urge that the price paid for silver by the United States Mint be increased to $1.29 an ounce.

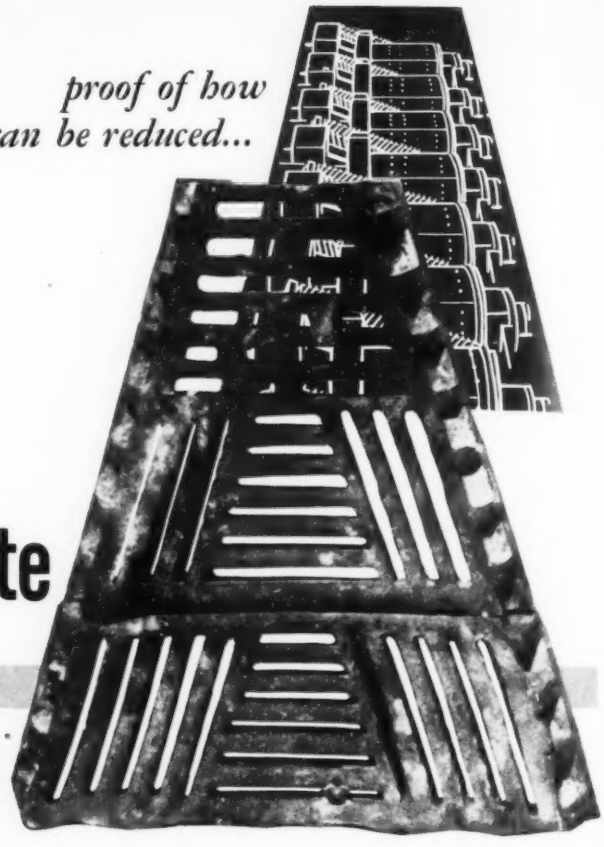
10. We advocate the construction and maintenance of mine-to-market and mine access roads to provide better and cheaper transportation for the products of our mines.

11. We strongly recommend that operators of mines or quarries producing natural building or construction materials be granted the depletion allowances now enjoyed by other forms of mining.

12. We again urge that the tax recommendations of the National Mineral Advisory Council to the Secretary of the Interior be speedily enacted into law.

proof of how milling costs can be reduced...

this AMSCO® Grate has milled 193,797 tons



An actual example of how AMSCO Grates last longer, reduce shutdowns and increase milling profits.

Equally Big Savings On Liners, Too!
Recent production figures on Amsco double-wave Liners in a mill grinding copper ore: 667,308 tons ground . . . at a liner cost of about a half-cent per ton! *It will pay you to investigate the long, low-cost service of Amsco Liners!*

Find out more about Amsco Liners and Grates

Be sure to ask for a copy of Bulletin 449-ML. Describes the characteristics of Amsco ball mill alloys; gives additional facts on dollar-saving installations. Free copy on request.

Here's an actual photograph that proves an important, profit-building point to users of ball mill equipment . . . *the real cost of liners and grates is the actual service cost.*

This Amsco grate has milled 193,797 tons . . . compared with just 113,000 tons for a previously used hardened steel grate which ran under identical conditions. And, during this period of 72% greater tonnage milled, *the Amsco grate required no down-time for repair.* The previously used grate started to crack at 50,000 tons—required many shutdowns for plugging holes.

Because of heavy impact, this particular Amsco Grate was made of austenitic chromium-manganese steel—one of three Amsco alloys developed for specific conditions of impact and/or abrasion. These Amsco liner and grate alloys can result in big savings on milling costs. Amsco Engineers are fully qualified to make alloy recommendations based on your operating conditions—*write today for the name of the Amsco engineer nearest you.*

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Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

Muriel Sibell Wolle Describes

CARSON TOPS THE DIVIDE

Lost Trail, they called it, or Carson City, or even Bullockville, but whatever its name, it was perched on the crest of the Continental Divide at the head of Wager gulch on the north and Lost Trail gulch on the south. Its mines and mills spilled down both sides of tundra-covered slopes toward timberline, 500 feet below. The waters from Wager creek flow into the Lake Fork of the Gunnison river, then into the Colorado river and thence to the Gulf of California. The waters of Lost Trail creek flow into the Rio Grande river and on to the Gulf of Mexico. Elevation of the town is between 11,500 feet and 12,000 feet above sea level.

The camp was started in the spring of 1882 by Christopher J. Carson, who had tramped over the area some five years before and in 1881 had returned to investigate the country. He staked the Bonanza King and several other claims, and when assays from them showed returns as high as $400 to $500 in gold and silver, he decided to bring in his friends and establish a camp, which he was confident would be the "best in the San Juan."

While other camps complained that their properties were being neglected because "the boys were all on Carson Mountain," a big strike was made in the Cresco mine which revealed a pay streak two feet wide consisting of galena and brittle silver which assayed from $40 to $170 to the ton. Not far from the Cresco, and also at the head of Wager gulch, was the Kit Carson, the "pride of the camp." As soon as these discoveries were made, a meeting was called and on July 22, 1882, the Carson Mining district was formed. A motion was passed making the wages for assment work $6.00 a day if pick and shovel were used and $8.00 per day if powder and steel were used. In spite of its lofty location, many of the prospectors made preparations to remain close to their claims all winter, confident that they could "stick it" because of the abundant timber and water not too far below them.

The camp could be reached by a good 14 mile trail from Silverton or by a 16 mile trail from Lake City, of which the first 12 miles were good and the last four, up Wager gulch, were miserable and often almost impassable for loaded animals because of mud and snow. To rectify this the miners insisted that a road be built to their camp by the summer of 1883. Although such a road was ultimately completed its progress was too slow to suit the boys on the divide.

"What has become of Overseer Wager?" they clamored. "His road is going so slow that the present generation will never have the pleasure of using it." At the same time "parties with ample means" started to build a road up Lost Trail creek to reach their claims on the Rio Grande side of the divide. Upon its completion ores were packed through Antelope Springs and on to Pueblo for treatment.

Mine after mine was opened up during the Eighties—not only the Kit Carson, Bonanza King and Cresco, but also the Chandler.

But even with constant work and development of properties the camp did not boom in a big way. It produced good ore and piles of it lay on the dumps ready for shipment but its isolated position, its distance from railroads and smelters and poor road conditions to shipping points retarded its progress.

Col. W. M. Tuttle, who visited the camp in 1892, reported that the whole country was covered with prospectors and that new discoveries were still being made; that ore ranged from $50 to $2000 per ton in value and that with four paying mines Carson was on its way to being a first class camp. A new strike in the Maid of Carson opened up a body of black sulphuret ore and caused its owners to predict that by next season the Maid would be a "hummer." Fortunately, before silver values slumped in 1893, gold and copper had been discovered in the mines and the camp continued expanding.

During 1896, according to the *Gunnison Times*, there was great activity. "New houses are going up, new claims are opening and more stock is being added to the already large pack trains. No doubt now exists as to the permanency of the veins or the gold and copper values."

By 1900 men were talking about the chalcopyrite and silver sulphides that they were uncovering; the George III was being developed by a cross-cut tunnel and there was much talk of a matte smelter being built in the camp. Between 1900 and 1902 nearly 500 people lived on the Lake City side in the group of buildings at the edge of the big pines, in the last stand of forest below tim-

The hotel at Carson, the 12,000-foot-high camp which straddles the Continental Divide in the San Juans.

berline. Usually timber dwindles to dwarfed, scrubby specimens at 11,500 feet but at Carson the trees are more than 100 feet high and many have trunks five and six feet through. There are no willow nor aspen, just a great stand of white pine and above it, tundra.

One old-timer reports that the camp was practically deserted by the end of 1902; yet in 1905 the St. Jacobs (alt. 12,200 feet), was operating with a force of twenty-two men, all busy mining copper, silver and gold.

In 1946 and 1948 I visited Carson on horseback, once from each side of the range, and each time a cloudburst and I arrived there simultaneously. In 1950 I tried again via jeep and was able to explore the entire camp. An old prospector who knew the place well told me what I'd find.

"Never saw a camp like it," he said. "Eleven big properties in one gulch all with mills, smelting plants and boarding houses and more over the top on the other side. No need for them all either. Some of the smelters never worked. The St. Jacobs was the best gold property there. It had three shafthouses and lots of machinery, a big boarding house, a bunk house, a log stable and an office. It had a smelter too. I packed the machinery up there and built it, and by the time I got it up the company's lease ran out. I brought the smelter back to Lake City. That was the trouble with the camp. Too much speculation and building before the ore was proved up. It was wild-catted to death."

The trail the jeep took up Wager gulch had been bull-dozed out and it by-passes the rotten-timbered bridge across the tumbling mountain stream which I had gingerly crossed on horseback two years before. On the high meadows near the camp, stretches of the old corduroy road remain, and the site of the sawmill below the town can be identified. At Carson on the Wager gulch side, the buildings are in a better state of preservation than those on the Lost Trail side. The post office, the hotel, the saloon, a barn and many sagging mine buildings with rusted machinery imbedded in massive foundations line the valley as it narrows toward the top of the divide.

There is still ore at Carson and one mine property is being worked during the summer months, but the camp is dead, and today only birds and packrats nest in the Lost Trail post office in the empty pigeon-holes which line one side of the building.

ACTIVITIES OF U. S. MINING MEN

H. N. HOW, president of Western Machinery Company of San Francisco, long established firm of mining equipment manufacturers and engineers, has accepted the invitation of Secretary of Interior Oscar Chapman to serve on the Advisory Committee on mining machinery at Washington, D.C. The Committee's function is to assist the Defense Minerals Administration and the Defense Solid Fuels Administration in matters concerning mining machinery.

James Douglas, Samuel H. Williston and *Phil R. Bradley* recently were appointed to positions in the Defense Minerals Administration. Douglas has resigned as secretary of the Phelps Dodge Corporation to become acting deputy administrator of the DMA. He will assist Dr. James Boyd, administrator, in the supervision of programs designed to assure an adequate supply of critical and strategic metals and minerals. Williston, executive vice president of the Cordero Mining Company of San Francisco and executive vice president and director of the Sperry-Sun Well Surveying Company of Philadelphia, has been made director of the Supply Division of DMA, the programming and planning division which will work out expansion of mineral and metal production and governmental assistance for the expansion. Bradley, mining committee chairman and president of Pacific Mining Company, San Francisco, has been named consultant for the DMA and acting chairman of the Civilian Commodities Committee for Manganese, Chrome and Tungsten.

Melvin W. Cole, Nigel H. Bell and *Whitman W. Hopton* have been appointed to positions in the National Production Authority. Cole, assistant general manager of western sales for Bethlehem Steel Company at Detroit, has been appointed deputy director of the Iron and Steel Division of NPA and will help channel iron and steel products into the defense program. Bell, vice president in charge of sales of Sterling Windows, Inc., of New York City, has been made director of the Light Metals Division of NPA and will expedite production and distribution of aluminum and magnesium. Hopton, assistant to the president of Matthiessen & Hegeler Zinc Company, has been appointed director of the Tin, Lead and Zinc Division of NPA.

Thomas K. Graham, who has been working for Anaconda Copper Mining Company since 1935, has been appointed superintendent of the company's electrolytic zinc plant at Great Falls, Montana. He succeeds *E. C. VanBlarcom*, who has taken a job in the east. Both men are M.I.T. graduates. *M. O. Scott*, who has been assistant purchasing agent for the company for 10 years, has retired and has been succeeded by *Frank W. Switzer*, formerly Scott's asistant.

L. B. Manning has been elected president of the Mining Association of Montana for 1951 succeeding *O. P. Chisholm* of Helena, now a member of the executive committee. Manning is manager of the Trout Mining Division at Phillipsburg. Vice presidents are *Ted E. Collins*, head of the Collins Land Company, and *Lyman H. Brooks, Jr.*, president and manager of Irma Mines, Inc., Cooke City. *Carl J. Trauerman* of Butte, president of the Butte Copper Consolidated Mines, was elected secretary-treasurer.

Joseph H. Woodward II, has been elected to the board of the Wheeling Steel Corporation, Birmingham, Alabama. He succeeds his late father, *Alan H. Woodward*.

Charles Tilford of Wallace, Idaho, has been elected president and director of the Great Eastern Mining Company, Ltd. Others elected were *Sydney Pearson*, vice president and director; *A. A. Amonson*, secretary-treasurer and director; *H. F. Magnuson* and *Earl Anderson*, directors.

W. C. Page has been made president of the Utah Mining Association, succeeding *Paul H. Hunt*. Page is vice president and general manager of western operations, United States Smelting, Refining and Mining Company, Salt Lake City, Utah. Named as Association vice presidents were *A. G. Mackenzie*, a former manager of the Association; *R. D. Bradford*, general manager of American Smelting and Refining Company's western department; and *Carl Fitch, Jr.*, vice president and general manager of Chief Consolidated Mining Company. Board members elected were *James J. Lillie*, geological engineer for International Smelting and Refining Company, and *W. G. Rouillard*, superintendent of the American Smelting and Refining Company's Garfield smelter. *Ernest F. Goodner*, manager, American Gilsonite Company, was elected to the executive committee.

DR. FRANCIS A. THOMSON, 70, internationally known mining educator and recently retired president of Montana School of Mines at Butte, died January 11 at Spokane, Washington. He had been president of the School for 22 years. Born in London, he came to British Columbia in 1886 and graduated from the Colorado School of Mines in 1904. Later he studied in London and Paris. He was dean of the school of mines at Washington State College from 1908 to 1917, and held a similar position at the University of Idaho at Moscow until 1928. He was a member of the A.I.M.E. and several other organizations.

WILLIAM S. PALEY, chairman of the board of the Columbia Broadcasting System, has been named head of President Truman's new board, the Materials Policy Commission. The commission will make a long range study of all the basic raw materials needed by U.S. industry. Other members of the commission are Arthur H. Bunker, president of Climax Molybdenum Company, Climax, Colorado, and a partner in Lehman Bros., New York; George R. Brown, mining engineer, member of the Materials Policy Commission and vice president of Brown and Root, Inc., international engineers and contractors; Eric Hodgins, editor and writer, New York; and Edward S. Mason, professor of economics, Harvard University.

A. C. Harding, general manager of Black Hills Bentonite, Inc., Moorcroft, Wyoming, has acquired the additional job of state senator from Crook County, Wyoming.

Al C. Fisher recently was elected president of South Butte Mining and Milling Company, which operates the Anna Butte and Jewel claims in southwestern Butte, Montana. Others elected were *Rudy Endresse*, vice president, and *Earl Lynch*, secretary-treasurer.

W. D. McMillan, supervising engineer, New Mexico section, U. S. Bureau of Mines, has been transferred from Silver City to the Region IV headquarters at Denver, Colorado.

Roy L. Cornell, who is vice president of California Testing Laboratories, Inc., advises that the company has moved its offices to 619 E. Washington Blvd., Los Angeles. Although he has retired from active participation in laboratory work he is still a consultant for the company.

John H. Cone is now engineer for the Combined Metals Reduction Company's Panacalite Division at Salt Lake City, Utah. He formerly worked for Geneva Steel Company at Dragerton, Utah.

A. V. Quine was appointed superintendent of The Goldfield Consolidated Mines Company, Colville, Washington, several months ago. He is living at Northport where the company's Deep Creek mine is located.

J. H. Heinicke, 1950 graduate of Colorado School of Mines, is working for the Greak Lakes Carbon Corporation as a

quality controlman at Socorro, New Mexico.

Frank E. Siegfreid, formerly shift boss for the Telluride Mines, Inc., at Telluride, Colorado, is now working for the Jones and Nylene Mining Company at Pueblo.

William F. Guenther, Jr., is now head of the Exploration Department, United Clay Mines Corporation, Trenton 6, New Jersey. He had been working for the Tennessee Phosphate Division of the International Minerals and Chemical Corporation at Columbia, Tennessee.

A. C. Ensign has been appointed resident manager of the U. S. Atomic Energy Commission's Monticello, Utah, plant, according to *J. W. Thompson*, vice president of the Galigher Company, which operates the Monticello mill under contract to AEC. Previously Ensign had been superintendent of the Magma Plant, Kennecott Copper Corporation, and had been associated with the Galigher Company. He succeeds *John N. Butler*, retired.

Clyde Collins of Carson City, Nevada, is the 1951 president of the western Nevada branch, A.I.M.E., and succeeds *Albert Silver*. *Parker Liddell* of Reno was elected secretary.

C. N. Schuette, consulting mining and metallurgical engineer, has moved his office to 6390 Barnett Valley Road West, Sebastopol, California.

John Evenoff has been transferred to the Inter-State Iron Company's engineering department at Virginia, Minnesota. He had been mining engineer at the Hill-Annex mine at Calumet.

R. M. Belliveau, Hibbing, Minnesota, has been promoted from district superintendent to general superintendent in charge of both openpit and underground Mesabi range mines of the Cleveland Cliffs Iron Company. *Jack F. Chisholm*, Taconite, has been promoted to assistant superintendent in charge of plant metallurgy at the company's Mesabi concentrating plants. *Fred Flink* succeeds *F. G. Sterling*, retired, as chief engineer, Mesabi Range, and *Ronald Pearson*, former district engineer at Cleveland Cliffs operations on the western Mesabi, is now assistant chief engineer, Mesabi Range. At the company's Michigan operations, *H. Walter Rambold* has been promoted from drill foreman to assistant superintendent and will have charge of all drilling in that state.

Charles Baxter is now chief engineer at the St. James mine, Aurora, Minnesota, operated by Oglebay, Norton & Company. He had worked for the Castile Mining Company at Ramsey, Michigan.

William A. Benson of Virginia, Minnesota, has been transferred from assistant resident engineer for the Inter-State Iron Company to chief engineer at Ishpeming, Michigan, for the Jones & Laughlin Ore Company, which is opening up the Tracy underground mine at Negaunee. Also at the Tracy mine as construction supervisor is *R. L. Balconi*, who had been superintendent of Jones & Laughlin's Vicar mine at Wakefield, Michigan. Another Vicar employee, *Anthony Leone*, master mechanic, has been moved to the Tracy as construction engineer. *John A. Basso*, chemical engineer, has joined the research laboratory staff of J&L at Negaunee.

Clyde Wolf, assistant general purchasing agent for Phelps Dodge Corporation, Douglas, Arizona, retired from that position on February 1, 1951. He will not sever his connection with the corporation, however, as he has been assigned to special duties in connection with the openpit mining development program at the Bisbee East orebody. He continues to maintain his office and headquarters at Douglas. Wolf is succeeded as assistant general purchasing agent by *Kline A. Ables*, who had been his assistant since July 1, 1934.

Milton Choquette of Stambaugh, Michigan, was promoted from assistant mining captain to mining captain at the Zimmerman mine of Pickands, Mather & Company. He was one of three men in the company's Iron River district properties to be promoted recently. The others were *Oliver Axelson*, from engineer and shift boss to assistant mining captain; and *Guerdon L. Anderson*, Stambaugh, from mining engineer on the district office staff to planning engineer serving all the company's mines in the district.

Guy B. Hunner of Crosby, Minnesota, has been named general superintendent for The M. A. Hanna Company on the Cuyuna range and The Spring Valley mine. He had been district superintendent.

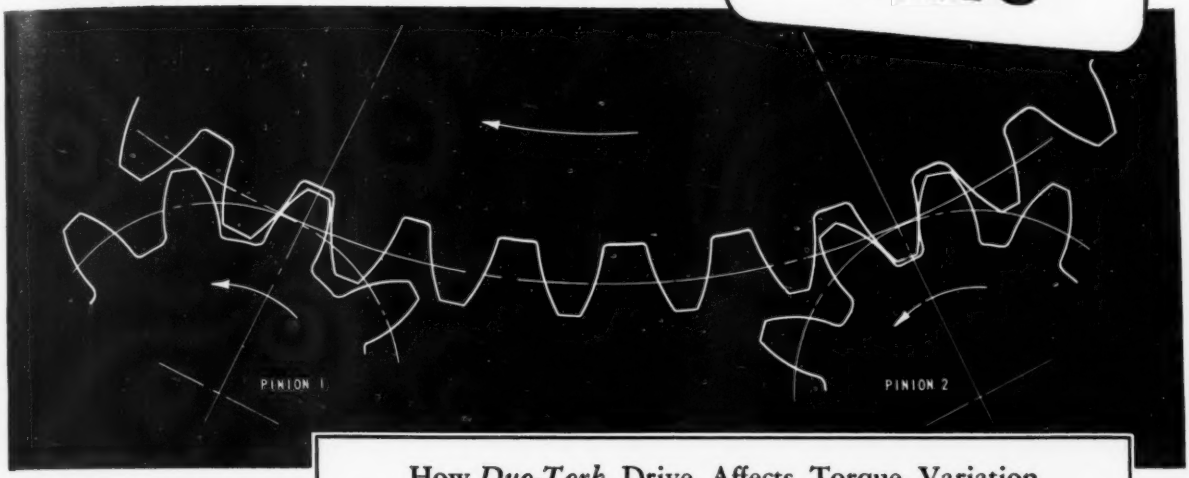
Thomas O. Moore, former consulting engineer for the Kennecott Copper Corporation at Santa Rita, New Mexico, is running the Columbus Hotel at Columbus, New Mexico, old site of the Villa raid.

Ralph Adair, until recently chief engineer of the North Carolina State College Minerals Research Laboratory at Asheville, has opened a consulting office to

Continued on page 63

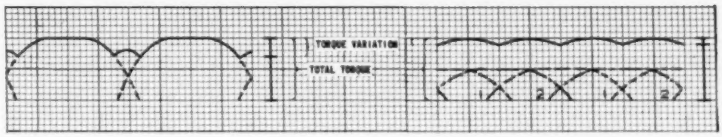
Much Longer Life FOR ROTARY KILN DRIVES WITH...

DUO-TORK *(STAGGERED PINION)* **Drive**



Duo-Tork drive eliminates "hard" gear tooth impulses. Pinion tooth in contact on pinion No. 1 is on centerline between gear tooth centers. Same tooth on pinion No. 2 is staggered — one-half tooth pitch past centerline.

How *Duo-Tork* Drive Affects Torque Variation



Single Drive with New A-C Gearing. *Duo-Tork* Drive with New A-C Gearing.

NEW *DUO-TORK* drive is a staggered pinion dual drive for large rotary kilns developed by Allis-Chalmers to give you twice as many gear tooth contacts per kiln revolution as a single drive (see above). The result is a smooth drive that protects the kiln, bearings, gears, reducer, shafting, and motor from destructive vibration.

Pinions are staggered so that they are one-half tooth pitch out of step. Vibration caused by gear tooth contact is practically eliminated. Each tooth impulse has only half the force of a comparable single drive. And *Duo-Tork* drive assures continuous production because kiln can be operated at reduced capacity using only half the drive.

Gear tooth shape has been improved, too. *Duo-Tork* drive utilizes the new 20° involute spur gear with long addendum pinion and short addendum gear tooth. The pinion tooth *rolls* evenly on gear tooth — *smooth, even* distribution of force from pinion to gear!

Other advantages of *Duo-Tork* drive:

- **Eliminates need for large *special* reducers and flexible couplings.**
- **Lower tooth pressures mean better gear lubrication, with no scoring or "wiping" of gear teeth.**
- **Maximum economy. *Duo-Tork* drive is less costly than single drive of over 125 hp. And, because wear is reduced, gearing lasts longer.**

For more facts, contact the A-C representative in your area or write Allis-Chalmers, Milwaukee 1, Wis. A-3280

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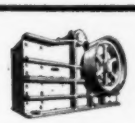
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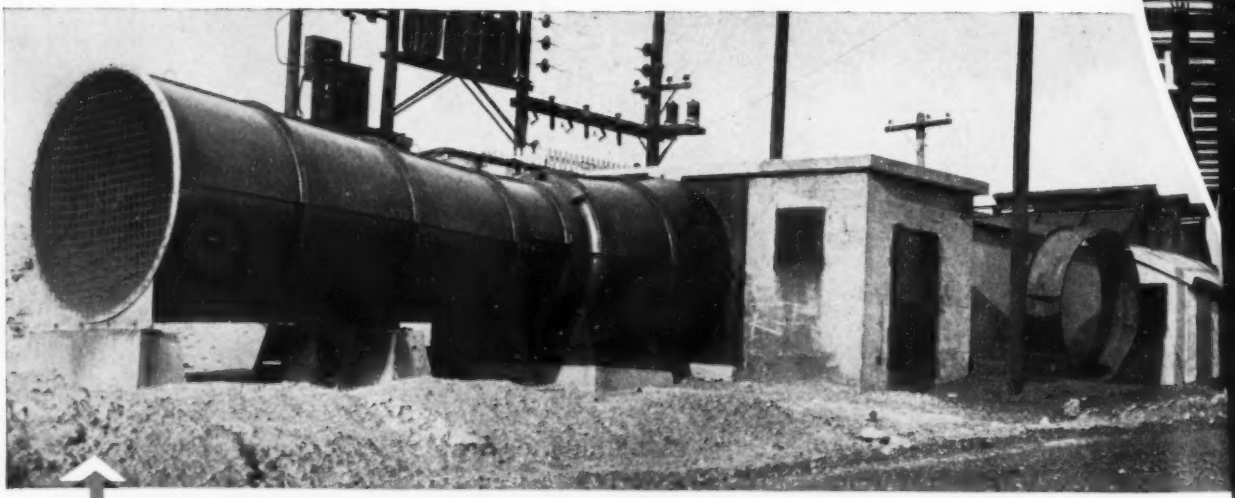


IF MAIN VENTILATION is your Problem

JOY AXIVANE* MINE FANS

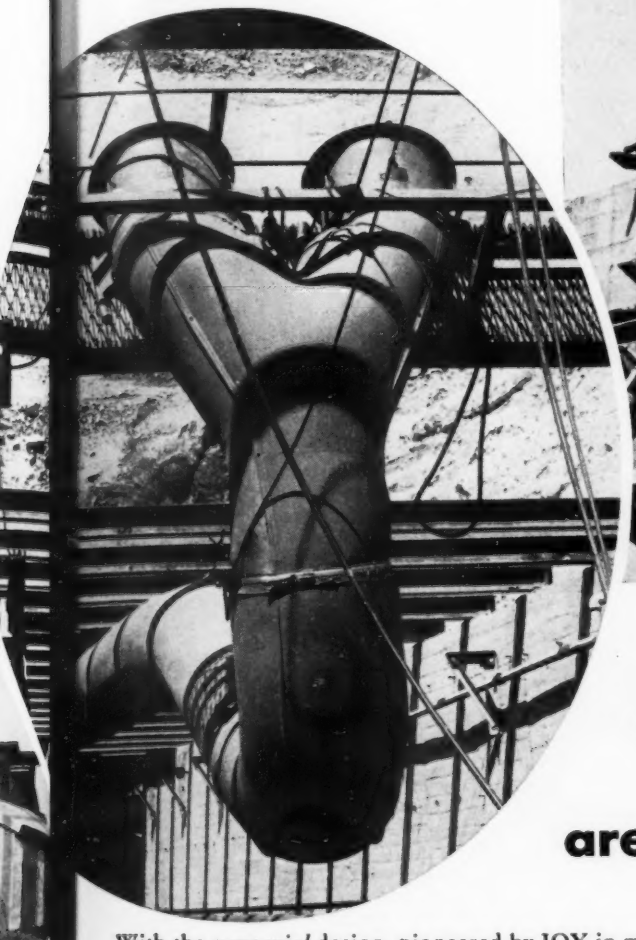
GIVE YOU MORE AIR AT FAR LOWER COST

*Trade Mark Reg. U.S. Pat. Off.

Right: a twin installation of Type I-21 JOY AXIVANE Blowers at a large metal mine.

BLOWERS

Below: the same twin units, looking down. Left, opposite page: a typical JOY AXIVANE Exhaust Mine Fan installation, at another metal mine.



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are *All-Purpose* units

With the *vaneaxial* design, pioneered by JOY in mine ventilation equipment, you secure the great advantage of unmatched efficiency over the widest possible operating range. JOY AXIVANE Blowers give you top performance in either high or low pressure service. You don't need different types of blowers for different lengths of ventilation tubing, and you eliminate blower replacement when the tubing length must be changed. What's more, JOY Blowers are compact and space-saving, operate more quietly, provide smoother air flow and require minimum power. ● Let JOY solve your air supply problems . . . there are types and sizes of AXIVANE Blowers and Fans to meet every mine ventilation requirement.

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hauling ROCK at Pine Canyon

One of the toughest of highway jobs cuts along the steep side-walls of rocky Pine Canyon near Wenatchee, Washington, and gives further proof of the ability of LeTourneau's modern, big-tire, rear dumps to handle rock or ore. With over 600,000 yards of shovel rock to be carved from the cliff face in relocating 4.4 miles of U. S. 2, Goodfellow Brothers, Inc. assigned the most difficult hauling to 3 LeTourneau 16-ton Tournarockers. Some material was sidecast . . . much of it had to be dumped to widen the narrow mountainside trail. Commenting on his Tournarockers, James B. Goodfellow says . . . "VERY SATISFACTORY".

Here are contractor's own figures

Loading under a 2-yard rock shovel, the Tournarockers carry 9 to 11 bank yards each trip. On one 2800-foot, one-way haul, actual job records show that Tournarockers easily handle shovel production of 1000 yds. every 8-hour shift. This rate of production, day in, day out, helps keep the job on schedule in spite of the rough haul roads, steep grades, and confined hauling conditions at altitudes of 2000 feet.

13′ 9″ turn radius speeds handling

Short, 90° turns, and positive electric steer by push-button control, permit easy turning and spotting anywhere along the narrow trail for load and dump position. Oversize, disc-type air brakes on all 4 wheels (4176 sq. in. total braking surface) give operators complete safety throughout the hauling cycle. Positive holding action of 4-wheel brakes . . . plus front-wheel drive on 186 h.p. Tournapull prime mover . . . let the Tournarockers dump safely out over the edge of mountainside fills. Simple electric hoist raises body to vertical position . . . streamlined bowl clears loads instantly.

Important savings for you

These same revolutionary Tournarocker advantages that are helping Goodfellow Brothers, Inc., lick steep slopes and rough going on the Pine Canyon project offer new low-hauling costs for your mines and quarries. Ask your LeTourneau Distributor about this 16-ton, rear-dump Tournarocker. He can also give you complete information on 9-ton and 35-ton Tournarockers . . . and will show you money-saving interchangeability with Carryall Scrapers, bottom-dump hoppers, cranes, flat-beds and other auxiliary hauled units. Your investment dollar provides extra insurance for the future with interchangeable auxiliary units that cost only approximately 25% of original unit cost. Write or call NOW!

Big target . . . Operator on Goodfellow Brothers' 2-yard shovel has large target with Tournarocker's 12′ 5″ x 8′ top opening . . . speeds shovel swings, has less spillage.

Rock body . . . Here's a typical load of big-chunk rock carried by Tournarockers along Pine Canyon's slopes. 186 h.p. for 16-ton capacity licks the toughest hauling conditions.

90° turns with positive power steer . . . Short 13′ 9″ turning radius is an important advantage where operators have to turn and dump their loads along these narrow trails.

Front-wheel drive . . . Means you can keep the drivewheels of the prime mover on firm ground. Front or rear wheel air brakes can be set independently.

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HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

GRAB SAMPLES From the Mail

So Useful for Busy Men

I'm receiving WORLD MINING regularly and I'm very glad to get it because it gives me, in a short time, a general view of what is happening in mining all over the world. Specially it is so useful for us busy men, who have no time to read our magazines as we ought to do. I thank you very much for this. Would you be so kind as to take notice of my new address?

Ir. J. van de Velde,
Mining Engineer,
Arosa, Switzerland

As Mining World Says—"Our Error"

Dear Sir:

In your esteemed magazine under the International Panorama, appearing in the October, 1950, issue, your correspondent made mistakes, not to say some rather queer statements about diamonds and bauxite in Netherlands Guiana (Surinam). Herewith I may correct them.

Diamonds have not as yet been recovered from any bluish clay.

The discovery of bauxite in the Nassau Mountains was made some years before 1930. In the first part of 1949 it was, if you like to call it so, rediscovered by a Scientific Research Expedition. Since then no thorough investigation has been carried out.

There may be a connection between the bauxite and the epidiorite, but this still will have to be proved. Moreover, we do not know for sure from what rocks the coastal bauxite has been derived, though very probably staurolite schists took a part in some way or other.

Very queer at least is the statement that the coastal bauxite contains staurolite crystals and globigerines when considered in connection with the next statement that Nassau bauxite is purer. This can only be interpreted as meaning that the Nassau bauxite is purer because it does not contain staurolite crystals and globigerines. This does sound rather weird, does it not? Moreover, as the Nassau bauxite has not been thoroughly investigated it is positively a mistake to make any statement as yet about the purity of the Nassau bauxite in comparison to the coastal bauxite.

It seems to me that MINING WORLD does not have an insight in the matter, but as we say in Dutch, you have heard the sound of the bell, but do not know where to look for the bell.

Ir. H. Schols,
Director, Geological Mining Service,
Paramaribo, Surinam

Excellent Service

Dear Sir:

Your publications, MINING WORLD and WORLD MINING, provide a most comprehensive cover for world-wide mining operations and are of considerable interest to the staff here. Thanking you and congratulating you on your excellent service.

D. W. Hopkins,
Metallurgical Dept.,
University College of Swansea,
Swansea, Wales.

Subscriptions in Sterling Are Available

Dear Sir:

I have been receiving a copy of WORLD MINING regularly for two years. It is my wish to be able to subscribe to MINING WORLD but not knowing the correct agent to contact here in South Australia or overseas I am writing you in an endeavor to become a subscriber.

The magazine, WORLD MINING, contains a lot of interesting news that we would never hear of out here, so am very grateful and look forward to receiving my copy.

A. McDonald,
Manager, R. A. McDonald, Mining Contractor,
Blinman, South Australia.

Subscriptions in sterling are acceptable from all sterling areas if sent to P. J. Sergeant, Mining World, c/o Barclay Bank, 72/73 Cheapside, London E. C. 2, England. Rates are 28s, 2d for one year and 50s for two.—Ed.

WORLD MINING

The International Department of MINING WORLD

INTERNATIONAL PANORAMA

ROME—The Italian Government has decided to appropriate nine billion lire for mine development, one billion for exploration work and has received applications from mine operators for the equivalent of five billion lire to buy machinery in the U.S. and Europe. Sulphur, bauxite and iron ores reportedly will receive a major share of the allocations.

CERRO DE PASCO and LA OROYA, PERU—The Export-Import Bank has approved a loan to the Cerro de Pasco Copper Corporation for a maximum of $20,800,000 with which the corporation will build a new hydroelectric plant on the Paucartambo River, will expand concentrating facilities at Cerro de Pasco and will install a zinc refinery at La Oroya. The new plant will produce about 70,000 tons of zinc annually.

PORTSMOUTH, OHIO—The Detroit Steel Corporation expects to double its ingot capacity to 1,290,000 tons annually and to increase finishing capacity from 180,000 to more than 1,000,000 tons by 1952 at a cost of $50,000,000.

MONTREAL—The Dominion Steel & Coal Corporation has contracted to sell Great Britain 1,000,000 gross tons of iron ore annually for the next five years beginning in the 1952 shipping season. The ore will come from Dominion's subsidiary, Dominion Wabana Ore, Ltd., Bell Island, Newfoundland, where $6,000,000 will be spent to enlarge facilities.

MORRISVILLE, PENNSYLVANIA—A $300,000,000 steel mill will be built here by four construction firms for the U.S. Steel Corporation. The mill will use ore from the company's new iron fields in Venezuela.

DODOMA, TANGANYIKA—The Nickel Corporation of Canada has applied for an exclusive prospecting license on 1,000 square miles in the Kondoa and Dodoma regions, evidently as a result of reports from two of their geologists on findings in the area.

BAUXITE, ARKANSAS—The Aluminum Ore Company, a wholly owned subsidiary of the Aluminum Company of America, will build a new alumina plant here to process low grade bauxite ore mined by the ore company. The new plant will boost, by 50 per cent, the company's alumina output.

NEW YORK CITY—Domestic ilmenite production during 1950 was at the all time high rate of about 400,000 gross tons.

HAVANA—The Mining Equipment Corporation, a subsidiary of N. V. Billiton Maatschappij of The Hague, will operate the United States Government-owned Nicaro nickel plant on a fee basis. First production is scheduled for late 1951.

PITTSBURGH—Steel production during one week in January reached an all time high in the United States when 2,017,000 tons of ingots and castings were poured.

LAREDO, TEXAS—The price for antimony has been increased 10 cents per pound to 42 cents. It is the first price raise since September 11, 1950.

SAN FRANCISCO—California's production of 16,110 short tons of lead in 1950 was the largest tonnage ever mined in the state in one calendar year.

SAO PAULO—Three manganese deposits have been discovered in Brazil. Two are in the state of Espirito Santo and the third in Minas Gerais.

SINGAPORE—Production of 57,540 tons of tin in Malaya in 1950 was the highest yearly tonnage in the last nine years.

WASHINGTON—A subsidiary of Newmont Mining Company, Mid-African Exploration Company, has been advanced $4,200,000 by ECA for financing the resumption of copper mining in the middle Congo.

PARIS—The first continuous hot-strip, steel rolling mill in continental Europe has been placed in operation by Usinor. The plant was built with ECA, Export-Import Bank and World Bank funds. Usinor was given $49,000,000 in ECA funds, the largest single amount to any firm in any Marshall-plan nation.

DALLAS—The Lone Star Steel Company has received the first expansion loan under terms of the Defense Production Act of 1950. The loan for $73,425,201.00 will be used to construct a steel plant adjacent to the company's iron blast furnace. RFC furnished $50,000,000.00 of the loan.

MEXICO CITY—Exports of refined lead to the United States during the first 11 months of 1950 were 196,852 tons compared to 114,193 tons in the same period of 1949.

LONDON—The British Ministry of Supply has purchased a large tonnage of zinc from U.S. producers for delivery over the next several months.

PITTSBURGH—The steel capacity of the United States is now rated at 104,229,650 tons per year and blast furnace capacity at 72,471,780 tons. These capacities are about 2,000,000 tons greater than the total world capacity outside of the United States.

NEW YORK—Imports of silver, 73 per cent from North and South American sources, reached a post war high of 139,300,000 ounces during 1950.

OSLO—Aluminum production in Norway reached a peak between 43,000 and 45,000 tons in 1950. In the first 10 months of the year 35,000 tons were exported.

TORONTO—The Sherritt Gordon Mines, Ltd., of Canada has received a letter of commitment from the United States General Services Administration for the production of nickel for five years.

RIO DE JANIERO—The first shipment of pig iron ever made from Brazil to the United States was made on January 17, 1951 when 11,200 tons was shipped from Victoria, Brazil, to Philadelphia, Pennsylvania.

WASHINGTON—The General Services Administration has signed a five year contract with the Apex Smelting Company for the annual production of 54,000 tons of aluminum.

St. Joe Lead to Accelerate U.S. Expansion Program

The ten-year construction and expansion program of the St. Joseph Lead Company, planned for the period from 1950-1960, may be completed within the next three years. In line with Defense Minerals Administration policy the company is stepping up its program, according to Andrew Fletcher, president.

Plans of the company include:

1. Opening a new lead-zinc mine in Washington County, Missouri. This project will cost about $5,500,000 and will result in production of about 2,000 tons of ore daily. To be completed in 1953.

2. Equipping a new mine at Hayden Creek with a 2,000-ton sink-float plant and other machinery. This project will cost about $2,000,000 when modernization of the Federal mill and purchase of underground mining machinery is added. To be completed in 1951.

3. Increasing the output of the lead smelter at Herculaneum, Missouri, from 65,000 to 100,000 tons annually. This project, to be completed in 1953 when a contract St. Joe has with the American Smelting and Refining Company expires, will cost $3,000,000 and will include the construction of a new slag zinc furnace.

4. Completing expansion of the Edwards-Balmat mines in New York. Costing about $3,000,000, this expansion will result in a 38 percent increase in output by the end of 1952.

5. Completing the new electric furnace and secondary zinc treatment plant at the Josephtown, Pennsylvania, electrothermic zinc smelter. The cost of work here is about $2,000,000.

The total cost of the work outlined above is in the neighborhood of $15,000,000.

Southern Rhodesia May Produce Platinum

If a pilot scheme is successful, Southern Rhodesia may become a very large producer of platinum. A syndicate of Bulawayo businessmen have been granted an exclusive prospecting order covering 70 square miles in the Belingwe district and have agreed to spend a minimum of £25,000 on operations during the next three years.

A leading British firm of consultants has found a way of extracting platinum from several tons of ore which have been sent to London. A pilot plant is being erected to test the belief that platinum can be produced commercially. Mr. J. E. Marzorati, a member of the syndicate, said, according to Reuter, that the Rhodesian Great Dyke Development Exploration Company had agreed to finance the systematic sampling of the ore. If the sampling has favorable results the company will erect a plant, which is already available in Bulawayo, to mill the ore. So far, at least 80,000,000 tons of ore, which had been found to bear nickel and copper as well as platinum, has been proved. The nickel and copper would be produced as by-products.

Miners at work in the Imini mine. Thin beds of manganese ore, up to one meter in thickness, are mined by underground methods.

Photograph by R. Pigneau, Marrakech

MANGANESE FROM FRENCH MOROCCO

With large ore reserves and output up from 55,180 to 233,830 metric tons a year since 1946, inadequate transportation alone is limiting production

Most of the known manganese ore deposits in North Africa are in Morocco. In Algeria and Tunisia only small deposits have been found; only one, that of Tuburnic in Tunisia has been the object of sporadic and small development.

In Morocco, on the contrary, large and high grade deposits are known and are becoming the site of several important mining operations. Geographically the deposits of Morocco are grouped in two principal regions:

1. Eastern Morocco, where ore is found in the Bou Arfa beds (South Oujda), Narguechoum beds, and Tanourat beds (in the Taourirt-Oujda region).

2. Southern Morocco, where, on the southern slopes of the Atlas Mountains are located the beds of Tasdremt (a high valley), of l'Imini, of Tiouine, of Bachkoun and Sarhro-Ougmar; the last three are in the Ouarzazate region.

Eastern Moroccan Deposits

The Bou Arfa deposit, situated 260 km. south of Oujda, is mined by the Société des Mines de Bou Arfa. The mineralization is localized in bedded pre-Triassic rocks, and distributed in two distinct layers: in the lower layer, at Hamarouet, the ore is present in the form of pockets and in the other layer, at Ain Beida, the ore is found in the form of lenses. The grade of the ore varies very much from one spot to another. At Ain Beida, where the most important reserves are, there is only a 30 percent manganese content (with 13 to 15 percent iron), but it is remarkably free of impurities (lead, silica, etc.). The fines are purified and sintered in a plant at the mine. The final product contains 36 percent manganese. The mine produces, also, in very much smaller quantities, 45 percent metallurgical grade ore and some chemical grade ore.

The average production from Bou Arfa is 5,500 tons monthly of metallurgical grade ore and 120 tons monthly of chemical grade ore.

In the Taourirt-Oujda region, to the south of the Fes-Oujda railway, a number of small manganese-bearing beds extend for a length of about 50 km. Two of the beds, Narguechoum and Tanourat, are being mined by the Société Internationale Miniere du Maroc (Intermine). The ore, hard and of excellent quality, with an average manganese content from 45 to 50 percent, is sorted by

1949 PRODUCTION OF METALLURGICAL GRADE MANGANESE ORE BY COMPANIES IN FRENCH MOROCCO BY METRIC TONS AND GRADE

Mining Company	*Metric Tons*	*Percent Mn.*
Societe Anonyme Cherifienne d'Etudes Minieres (Imini Mines)*	98,644	51
Société des Mines de Bou Arfa**	66,074	33
Compagnie Tifnout-Tiranimine (Tiouine)	34,598	46
Omnium de Gérance Industrielle et Miniere (M'Koussa)	9,713	40
Intermine (Narguechoum)	6,172	46
Société Miniere de Sarho-Ougmar (Tifermine)	3,401	....
Tisgui-Lilane	1,580	....
Société Chérifienne de Mines (Glib en Nam)	1,176	....
Others	520	....
TOTAL	221,878	

* Also 1,152 metric tons of chemical grade ore.
**Also 10,800 metric tons of battery grade ore.

The average monthly production is 500 tons.

The mines of eastern Morocco are not handicapped by transportation difficulties. The ore is shipped by railway to the Algerian port of Nemours. These mines are likely to increase their production by 50 percent in the coming years. However, fairly limited ore reserves prevent large scale development.

Southern Moroccan Deposits

Manganese deposits in southern Morocco are found in rocks of two geologic ages. The Tiouine deposits in Cambrian rocks are irregular but the ore is hard and massive. Cretaceous beds unconformably overlie the Cambrian. Manganese deposits in the Cretaceous beds apparently contain secondary enrichments of fine-grained ore.

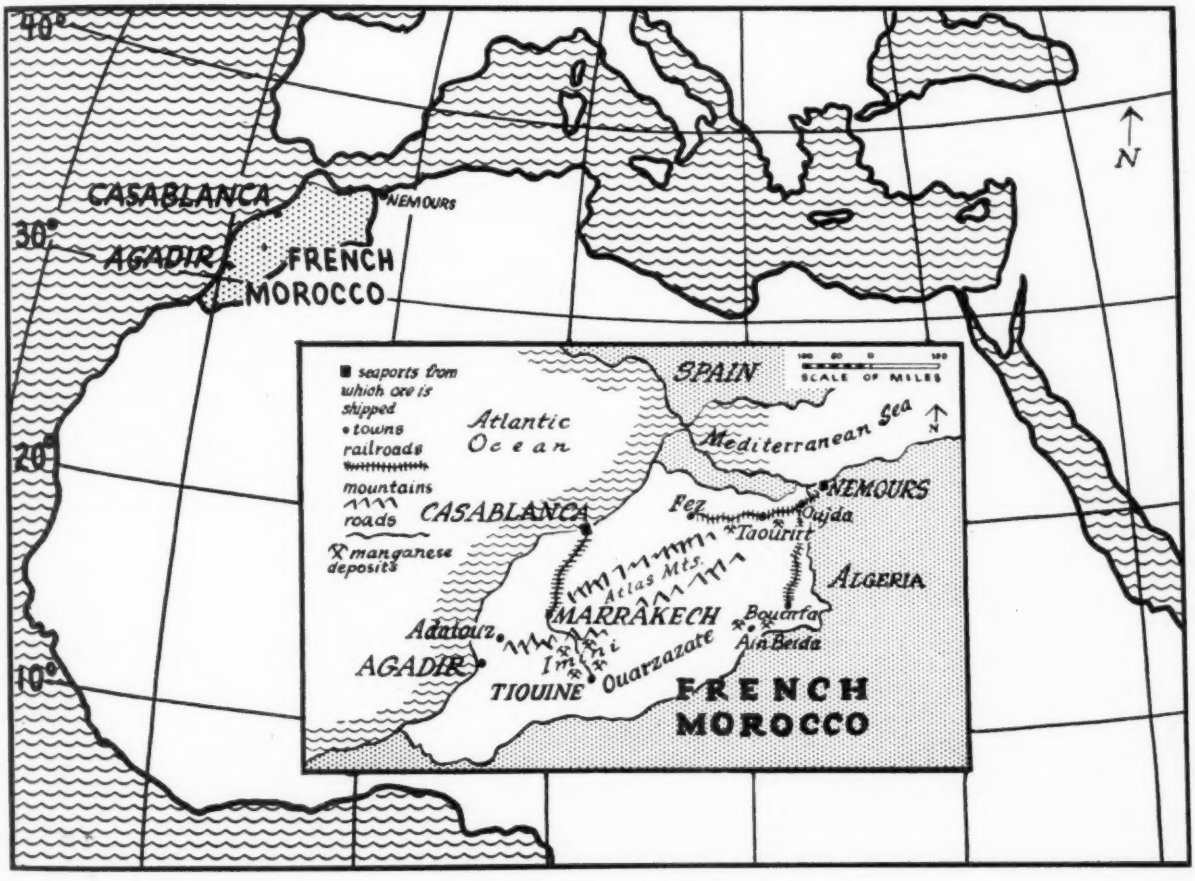
a. The Tiouine deposit is about 200 km. south of Marrakech near the road from Ouarzazate to Marrakech. Tiouine is south of the Haut-Atlas Mountains and Marrakech is north of them. The mine is operated by the Compagnie Tifnout-Tiranimine, a subsidiary of the Omnium Nord Africain. The ore, hard and silicious, occurs in very irregular, lenticular seams in a formation which has been traced over a length of about 12 km., but only three zones, several hundred meters long, are actually mined. The yearly output is about 34,000 tons of ore averaging 34.0 percent manganese.

Photograph by Verdy, Casablanca

The Sidi Marouf plant of the Societe Anonyme Cherifienne d'Etudes Minieres on the outskirts of Casablanca sinters 100,000 tons of fine-sized manganese ore per year.

b. The largest deposit of Imini, about 15 km. north of Tiouine, is mined by the Société Anonyme Cherifienne d'Etudes Minieres (S.A.C.E.M.). The exploration work, commenced in 1929, has proved the existence of a bed of secondary concentration in which are three under-

From French Morocco, in northwestern Africa, manganese ore is exported from seaports on both the Atlantic Ocean and the Mediterranean Sea. In the small, inset map the manganese-producing areas of French Morocco are shown in their relative positions to roads, railroads and the Atlas Mountains.



Photograph by R. Pigneau, Marrakech

All ore from the Imini mines of the Societe Anonyme Cherifienne d'Etudes Minieres is transported over the road of "1,800 turns" in 12-ton capacity trucks. Pictured here is a convoy of loaded trucks crossing the Haut-Atlas Mountains at a height of 7,900 feet. Note the snow-capped mountains which reach an elevation of nearly 12,000 feet and are snow-capped most of the year.

ground mineralized seams irregularly extending from the east towards the south for about 20 km. The larger seam is from 200 to 500 meters long; its thickness varies from 20 centimeters to one meter. The three seams are enclosed in a bed of magnesian limestone 10 meters thick.

The mine of Imini, due to lack of transportation, shut down during the war but was able to reopen in 1946-47. The resumption of activity yielded 6,400 tons of ore in 1945 increasing in 1949 to nearly 100,000 tons of metallurgical grade ore and 11,000 tons of battery grade manganese.

The principle obstacle to increasing production is the difficulty of shipping the ore, a problem which is discussed at the end of this article.

c. The deposit of Tasdremt located in the neighborhood of Aoulouz, belongs to the Société Miniere d'Aoulouz. It is composed of seams interstratified in the base of the transgressive formations of Cretaceous Age. The ore is hard; it contains 42 percent manganese and five to seven percent lead.

Studies have been made, with successful results, for a method to treat this lead-bearing manganese ore for the recovery of both manganese and lead. The decision to start mining rests on the problem of shipping the ore.

d. The Tifermine mine, in the Ouarzazate region, has been operated since 1948 by the Société Miniere de Sarho-Ougmar, and 3,400 tons of ore was mined in 1949.

At the Bou Tazoult deposits (Imini deposit), the site of most of the mining, manganese minerals are pyrolusite and of psilomelane, the average grade being 47.5 percent manganese with 12 percent silica. However, in certain places, the manganese content is over 51 percent with only 7 percent silica. The ore generally is friable and pulverizes easily.

A washing plant, now being built, will upgrade low grade ores not now mined and will produce a 51 percent manganese concentrate.

In the center of the Bou Tazoult very high grade manganese crops out on the surface. A small mechanized open pit mine is now in production. Output is extremely high

Surface plant of the Imini manganese mines of the Societe Anonyme Cherifienne d'Etudes Minieres, ten miles from Tiouine, in the southern part of French Morocco.

Photograph by R. Pigneau, Marrakech

Photograph by R. Pigneau, Marrakech

General view of the mine camp for the Imini mines.

grade chemical-grade manganese, with some shipments assaying 92.00 percent MnO_2.

Fine Ore Sintered

The pulverized ore is sintered at the Sidi Marouf plant, constructed by the S.A.C.E.M. in the outskirts of Casablanca. The agglomerating yields rich sinter containing 57 percent manganese and 10 percent SiO_2. The plant at present is capable of treating 100,000 tons per year. Eventual doubling of plant output is anticipated and initial construction was made accordingly.

PRODUCTION OF MANGANESE ORE [a] IN FRENCH MOROCCO IN METRIC TONS FROM 1942 TO 1949

Year	*Metric Tons*
1942	44,273
1943	49,010
1944	27,550
1945	44,458
1946	55,180
1947	109,452
1948	214,412
1949	233,830

(a) Chemical grade ore included.

Transportation Problems

The greatest obstacle to the development and production of the Moroccan manganese ores has been the problem of transportation. If the ores of eastern Morocco are shipped by railroad to a seaport (Nemours), those of southern Morocco, in order to arrive at Casablanca, must be transported by road from the mine to Marrakech, then by railroad from Marrakech to the coast. The road, with 1,800 turns, over which the ore is trucked to Marrakech from the mines of Imini (185 km.) and of Tiouine (200 km.), crosses the Haut-Atlas Mountains, along the edge of Tichka peak (altitude 7,900 feet). A special company has been formed to transport the ore, the S.T.M., using 155 trucks of 12-tons capacity each. Although excellent, the road can barely handle present traffic amounting to not more than two convoys of 20 trucks which daily make the round trip from the Tiouine and Imini mines to Marrakech. On the other hand, with this mode of transportation a necessity, the repair of the trucks, due to rapid wear and tear, appreciably increases the general expenses. Therefore, in the quoted price for ore F.O.B. Casablanca, transportation accounts for nearly 75 percent of the total (of which 60 percent is for the one-way loaded trip).

UNITED STATES IMPORTS OF MANGANESE ORE FROM FRENCH MOROCCO IN SHORT TONS IN 1948-1949 AND FIRST NINE MONTHS OF 1950

Year	*Ore In Short Tons*	*Manganese Content In Short Tons*
1948	300	166
1949	1,432	798
1950	22,468	11,691

Transportation Solutions

A complete study of the problem of moving ore really should be taken up next. Several solutions have been proposed;

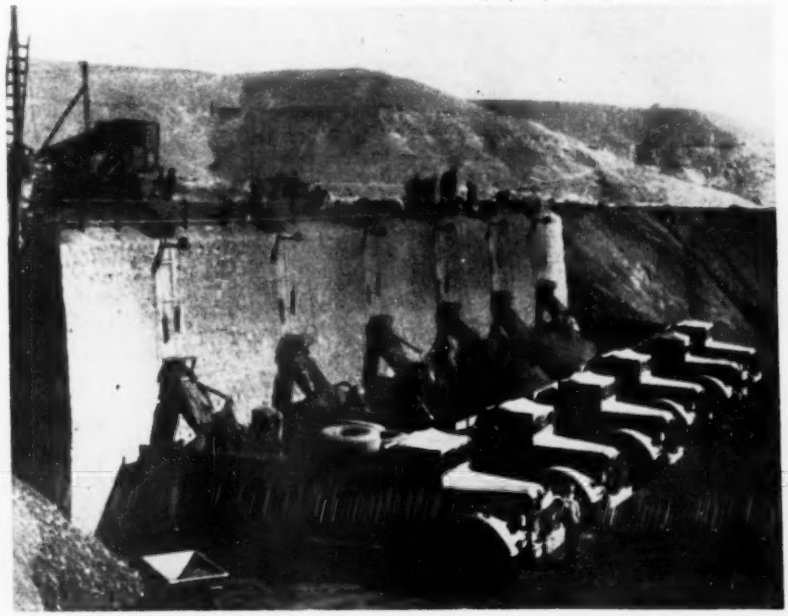
1. Shipment to the north by construction of an aerial tramway, with a length of more than 50 km., over the Atlas Mountains and ending either at the high valley, or at Ourika, or at Oued Zat at a point to which the railway from Marrakech could be extended without difficulty; or shipment to the north by the driving of a tunnel 13 km. under the Atlas.

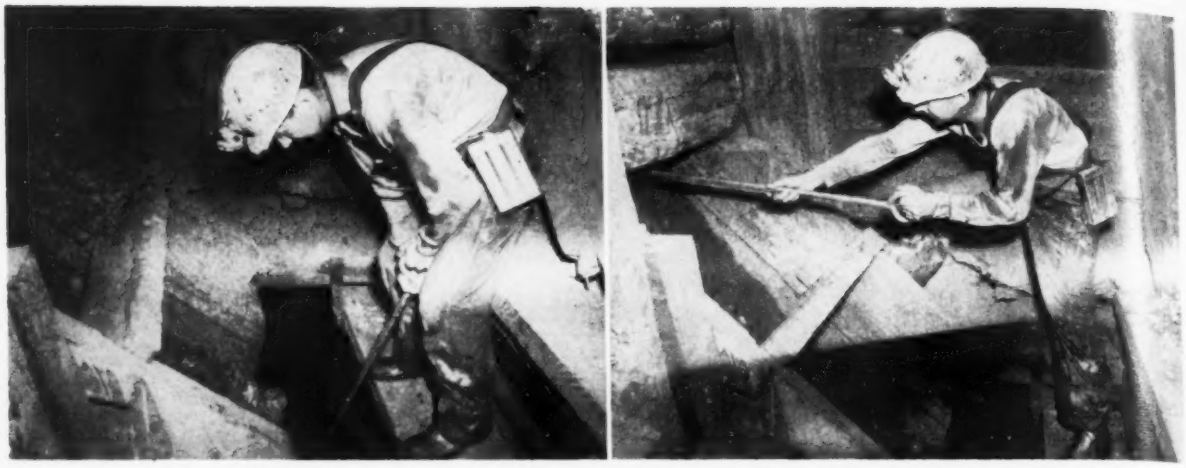
2. Shipment to the west by construction of an aerial tramway of 70 km. in length leading to the outskirts of Aoulouz; the ores would be transported from Aoulouz to the seaport of Agadir by trucks. This way of shipment would present the advantage of removing the obstacles to opening up the Tasdremt deposit.

Lowering of the total production costs of manganese ore by a reduction of transportation costs from the mines to a sea port would permit Morocco, which in 1949 produced 222,000 tons of metallurgical grade ore and 12,000 tons of chemical grade ore, to attain an annual production of 400,000 tons and to maintain this rate of output for the next 20 years.

Over 100,000 tons of manganese ore was trucked from the Imini mines to Marrakech in 1949. Six trucks are being loaded at the mine, in the photograph below, before starting the 115 mile trip.

Photograph by R. Pigneau, Marrakech





In these pictures, a research trainee demonstrates the ease with which an operator, working with the standard chute, performs his two main jobs. LEFT: The operator raises the chute door with a standard chute bar. Note the 3 by 12 inch stopboard to the left of and below the operator's head; the stopboard prevents large pieces of ore from rolling out and crushing the operator's legs or feet. Studies made since this picture was taken have proved that two stopboards are better than one (shown here). RIGHT: The trainee demonstrates the use of the chute bar in freeing ore which hangs up in the chute. The operator's platform, on which the loader stands, provides a safe working place for the operator, and at the same time puts him in the best position for freeing the chute, or for adjusting the chute door.

BUTTE DESIGNS IMPROVED CHUTE

ACM Co's. new wide-mouthed chute, designed by a supervisory trainee, is simpler, safer, more economical and more efficient than the old chute

One of the most valuable things that a large mining organization can do for smaller mines is to make available data, designs, and information that a small mine has neither the time nor the staff to assemble. This valuable story on chute design is released to small miners by MINING WORLD through the cooperation of Anaconda Copper Mining Company's worldwide Engineering Research Department.—Ed.

For every square mile of surface in the city of Butte, Montana, the "New York City of mining," there are probably more chutes than in any other square mile in the world. Butte miners work with chutes; foremen and shiftbosses appreciate the importance of chutes, the importance of building them rapidly, and of keeping them in uninterrupted service for as long as possible. The chute is a key link in the chain of underground ore production.

For many years the standard chute door used in the Butte mines was the Tramway mine's safety chute. It was standardized with respect to timber and its 20-inch wide jaws were designed for small cars. With the adoption of the larger Granby car, the Tramway door became obsolete for one-spot loading; two spots were required to load a Granby car. Efforts to overcome this problem resulted in various wide-mouth chutes being developed at different mines.

Trainee-Designed Chute

Candidates for supervisory positions with ACM Co. take the company's two-year training program. During the two-year period, trainees spend six months in each of four departments: operations (as a miner in drifting, raising and stoping operations), engineering, sampling and engineering research. At the end of the two years, a candidate is placed in the available position which best suits his talents and interests.

During the six months of research, each trainee is given freedom to work on a problem of his own choice. In 1948, research trainee Daniel P. Griffin was assigned to study the standardization of a Mt. Con or Arizona-type chute.

Mr. Griffin conducted his chute studies and experiments at the Mt. Con mine in north-central Butte from April 26 through June 14, 1948. The final design incorporated proven practice, sound engineering design, and suggestions from various ACM Co. personnel, with his own ideas. In June 1948, recommendation was made that all mine foremen in Butte install and observe the performance of the new chute. Today, it is used throughout the Butte mines for loading to 57-cubic-foot Granby-type mine cars.

Simplicity of construction, ease of operation, full loading of Granby cars with one spotting, promotion of safety, and sturdy construction to give long, trouble-free, service were the features which were combined in the standardized chute design. Practice has demonstrated that the new chute is superior to previous chutes in all respects.

Features of the New Chute

The final chute design (see large drawing) includes a number of separate features which merit discussion:

Slope of Chute Bottom. The slope of chute bottoms in Butte has long been standardized at 45°.

Position of Chute Lip. In practice, former chute lips were placed 6 feet 0 inches above the inside rail and three inches from the rail. This position resulted in the far side of the car being filled to overflowing while the near side was approximately one foot short of filling. The distance from chute to rail was changed to seven inches and the cars

are now filled completely. Granby cars overlap the track on each side by 10 inches, and so catch all fines from the chute lip.

Width of Chute Mouth. A wide chute, utilizing the full girtwise space between stope posts (64 inches center to center), allows for full one-spot loading. Full utilization of the standard girt length permits installations of a 48 inch wide chute.

Chute Bottom. Prior to the study, 4 by 10 inch chute-bottom timbers had been framed with a 45° bevel cut on the door end for car clearance. In installing this beveled chute-bottom timber, some miners turned the bevel up, but others turned the bevel down. The vertical distance of the new chute from the rail makes it unnecessary to bevel the chute bottoms.

Chute Door. A new method of hanging the Arizona chute door made it easier to operate and greatly strengthened the weakest feature of the door, the method of attaching it to the chute mouth. The new door, prefabricated in the shop, consists of a ¼ inch steel plate, 41 or 48 inches long, to which are welded steel arms with holes drilled for pivot bolts (see photograph of chute door from below). At the pivot point, a ¾ inch hole is drilled in the chute jaw; a 2⅞ inch piece of ¾ inch O.D. pipe is driven into the hole to serve as a bushing. The bushing prevents the chute jaw from splitting. The door comes from the shop complete with bolts and washers; the chute jaws come from the carpenter shop with holes drilled and the bushing in place; a miner installs the door by merely bolting it to the chute jaws at the pivot points. At the center front of the door, a small space is left between a steel strap, which serves as a handle, and the door plate to allow the chute puller to insert his chute bar.

Chute Jaws. Chute jaws, precut in the carpenter shop (to the shape shown in the large drawing), allow use of standard 64 inch stope lagging for chute lining in the first floor. This arrangement streamlines the inside of the chute. Two holes are provided in the jaws. The lower hole is for normal installation of the chute door. The upper hole is used with fast running rock and provides a sharper angle for the door.

Chute-Mouth Bricking. Front bricking above the mouth of the chute, formerly cut to length by the miners when installing and wedged between the stope posts, is now placed behind the stope posts in a manner which saves installation time by eliminating tedious hand sawing, and which makes the structure much stronger and thus safer. The man pulling the chute is protected from any chute surges by this arrangement.

Rolling-Rock Precautions. A bricking stopboard, cut to length and placed between stope posts (as shown in large drawing), serves as a spreader to take the place of the removed girt, and limits to 24 inches the size of rock that can flow from the chute. Two 3 by 12 inch stopboards placed between the chute sides (in slots so that they can be removed) prevent rock larger than 10 inches in size from rolling down the chute and possibly injuring the chute puller.

A shift demonstrates the use of the chute template for positioning the chute bottom. With the template unfolded at the pivot point and resting on the track, the miner levels the bubble (near his left hand), and his partner scribes the line of the chute bottom on the stope posts. The template insures exact and uniform positioning; the top of the template is the top of the chute bottom.

Saddle Girts. Saddle girts are cut to length from slab bricking, wedged into position, and then supported on either end by a doubling-up post, a piece of lagging spiked to the inside of the stope post. Framed, triangular saddle girts were eliminated.

Operator's Loading Platform. A standardized loading platform gives the operator a feeling of familiarity with a chute even though he has never pulled it before. The loading platform is positioned with respect to the chute end by the method shown in the small drawing. This exact position proved to be the best

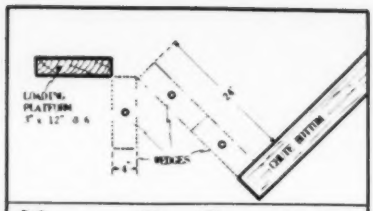
The new chute is trim, sturdy, easy to install. LEFT: In this view of the chute installation in the first floor above the sill, the chute front is on the right, and the chute side is on the left. Where bricking is placed behind the stope posts, as in this design, either the stope post or the bricking must break before ore pours out on the operator; also, because the bricking does not have to be cut to fit between stope posts, installation labor is substantially reduced. RIGHT: This view of the chute mouth and operator's loading platform as seen from the sill shows the chute-bottom timber framed with a 45° cut; the framing has been eliminated, saving both framing and installation time. The chute door is prefabricated in the shop, comes to the mine with the handle welded to the ¼-inch front plate, and with the arms drilled at the pivot point. As a bushing for the door pivot, a ¾ by 2⅞ inch pipe is driven into the chute jaw.

of several tried because:

1. It is safe. The largest boulder that passes through the chute opening also clears the operator's platform.
2. It is efficient. The operator's two main jobs, working the chute door and freeing the chute, can be done easily from the platform. The operator has full view of the car he is loading.
3. It is accessible. Space between the platform and the closed chute door is ample to allow the operator to climb to the platform from a Granby car.

Chute Bar. A standard chute bar is used to open the chute door. The bar is inserted in the opening provided between the handle and the door plate. The bar binds in that opening and the operator works the door by lifting with the bar.

Chute Template. The chute template (see photograph) is a hinged device for quickly and accurately positioning the chute bottom at a 45° slope with the lip six feet above and seven inches outside of the track. Constructed from 1 by 6 inch lumber, the template was originally built as a rigid unit but was changed to a hinged device which could be folded, making it more convenient to carry underground. A small level tube on the side of the template indicates plumb position of the vertical member. A chute template is kept in every tool locker. The template is one of the most important features of the new chute, providing an exact means of positioning the chute regardless of the position of sill timber.



METHOD OF POSITIONING OPERATOR'S LOADING PLATFORM

Construction—Assemble Parts

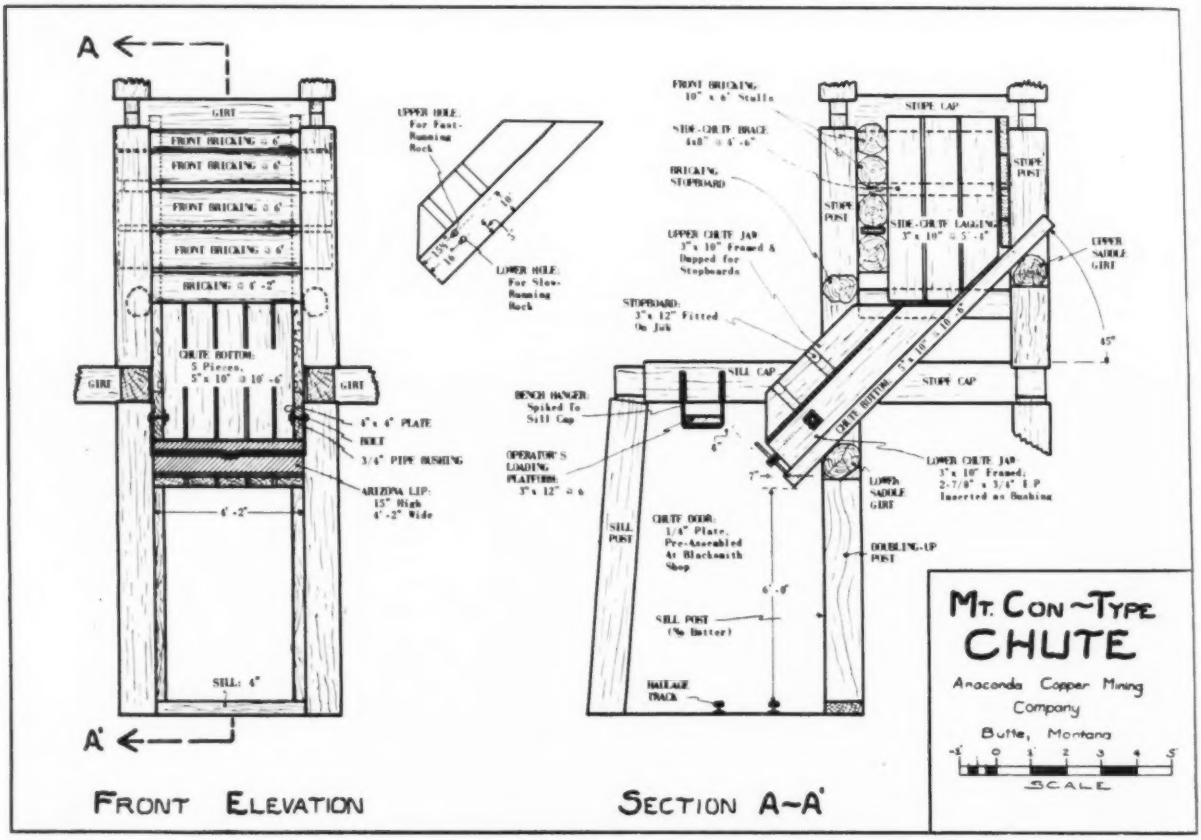
With materials for a complete chute ordered and delivered, two men install the largely pre-cut chute in eight simple steps:

1. They remove the girt from the set where the chute mouth is to be installed.
2. One man places the chute template on the inside rail, levels it, and his partner scribes on the stope posts a line which indicates the bottom edge of the chute bottom (also the top of the saddle girts).
3. The miners cut and install the two saddle girts and the place doubling-up posts under each end of the saddles.
4. The chute bottom is placed and spiked into the lateral position indicated by the chute template.
5. Chute jaws are erected, spiked to the stope posts, and the steel door is bolted to the chute jaws.
6. The two 3 by 12 inch stopboards and the bricking stopboard are installed.
7. Front bricking is laced in with side-chute braces (cut to length as shown) and the braces and bricking are spiked together. Side lagging is spiked to the inside of chute braces.
8. The operator's platform is installed.

Chute Is Proven Performer

Simple to install, rugged, durable, and safe, the new chute is giving good performance in the Butte mines. There is a great saving in installation time, but the real saving comes after the chute is installed. The saving in loading time, the increase in the load each car carries, and the longer trouble-free performance of the new chute are its advantages.

Daniel P. Griffin, who, as a supervisory trainee, conducted the chute study, is now an assistant foreman in the Butte mines.



An aerial view of the North Reduction Plant and the East Vertical Shaft of the West Rand Consolidated Mines, Inc. at Krugersdorp, Union of South Africa.

SOUTH AFRICAN URANIUM BY 1952

West Rand Consolidated Mines will erect a plant to extract by-product uranium from the gold residue slime of its new west Reduction Plant

The management of the West Rand Consolidated Mines, Ltd. has estimated that uranium recovery from its new West Reduction Plant will begin in the latter half of 1952. The aerial picture above, taken with the camera pointing northeast shows the playing fields, the sports clubhouse, and mine dwellings in the foreground. In the middle distance are the general offices, the workshops, the North Reduction Plant, and the East Vertical Shaft. The Reduction Plant is equipped with stamp batteries and tube-mills, the respective products from which are sand and slime. The washed sand is trammed to the 300-foot-high dump in the right center background. The waste-rock dump lies immediately to the left of the sand dump. Beyond the dumps is the town of Krugersdorp, which has a population of 75,000. The East Vertical Shaft, in front of the waste rock dump, has a steam hoist, and a vertical depth of 1,342 feet. From that depth, a sub-inclined shaft has been sunk to a depth of 3,815 feet.

Long Operating History

West Rand Consolidated Mines, Ltd. came into being as a result of the amalgamation of small companies which had been operating small areas on the outcrops of the reefs found on the property. As at present constituted, the company commenced milling operations in September 1908, at a rate of less than 20,000 tons per month. In 1923, when the mill capacity was 35,000 tons per month, the scattered nature of the underground workings and the large volume of underground water that had to be pumped from the workings began to make evident that operations had to be expanded to ensure a profitable operation. The expansion was accordingly effected, and by the end of 1928 the capacity of the North Reduction Plant had been increased to 80,000 tons per month, placing operations on an assuredly profitable basis.

Uranium From Slime

The South Reduction Plant was erected in 1935, and the milling capacity of the mine was raised to over 160,000 tons per month. Subsequent extensions to the two plants increased the total milling capacity to the existing figure of 250,000 tons per month, with the present capacity of the North Plant 150,000 tons per month, and that of the South Plant 100,000 tons per month. In terms of the arrangement recently concluded with the Atomic Energy Board of South Africa, the company will erect a plant for extracting uranium from the gold-residue slime of the West Reduction Plant, capacity 40,000 tons per month, now under construction. The West Reduction and the uranium plants will treat ore mined from the Bird Reef Series, which contain uranium in excess of the content in the other reefs of the mine. The uranium plant will be completed in the second half of 1952, by which date the total milling capacity of the mine will be 290,000 tons per month, among the largest of the South African mines. Excluding the future production of uranium, the mine output consists of gold, silver, osmium, iridium, and about 3,500 tons of pyrite per month. The pyrite is sold to another company for conversion to sulphuric acid.

The mine property extends over 2,294 claims, equivalent to an area of 5.2 square miles. Five reef horizons — the Main, South, Kimberly, Livingstone, and Bird reefs—outcrop on the property.

The picture was taken by the Aircraft Operating Company of South Africa, Ltd. and is reproduced through the courtesy of the West Rand Consolidated Mines, Ltd.

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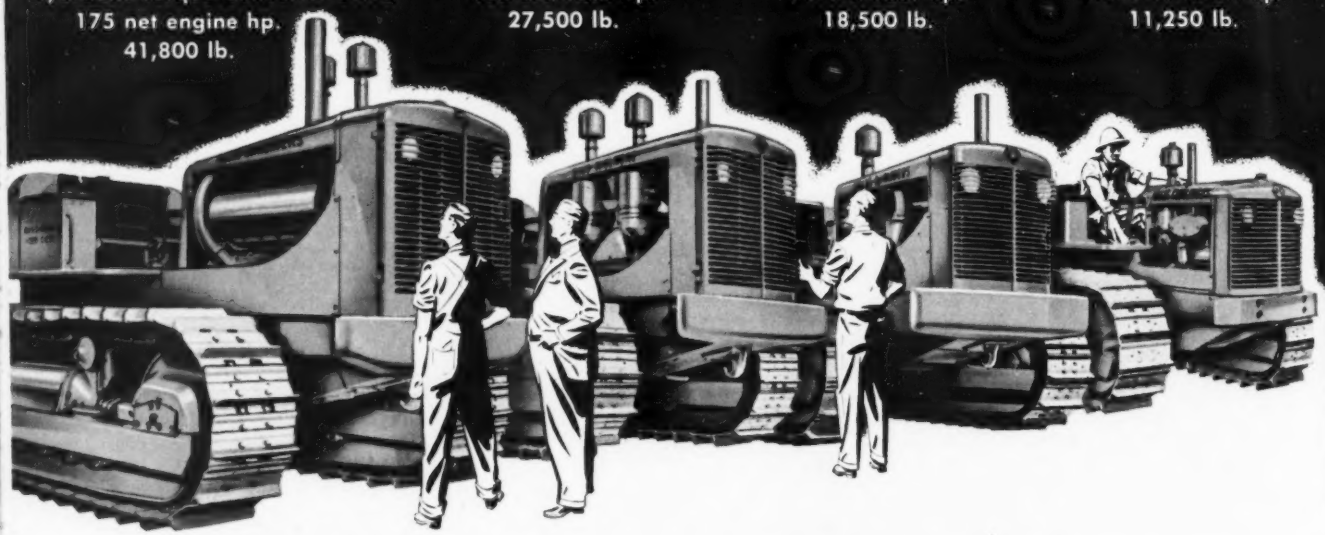

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PROMINENT MEN IN INTERNATIONAL MINING

K. L. Bhola, mining geologist, formerly employed by the Burma Oil Company in Assam, has joined the staff of India's Atomic Energy Commission at Ajmer, India.

Ir. I. van de Velde, mining engineer, has moved to 2B Paul Krugerstraat, Arnhem, Holland, from Arosa, Switzerland.

Lewis Douglas, U. S. Ambassador to Britain from 1947 to 1950, has been appointed a director of the Union Corporation, Ltd., one of the largest of the South African mining and finance houses. The company has extensive interests in gold and base metal mining as well as in industry.

C. T. Sweet is now technical consultant for the Société Miniere du Dahomey-Niger at Agades, Niger Province, French West Africa.

Andre Pouille and *Marius Authossere*, mine superintendent and foreman, respectively, of the French bauxite mine, Société d'Électrochimie d'Ugine at Brignoles, were two of a group of 16 French mining specialists who spent six weeks in the United States studying western and midwestern mines and U. S. Bureau of Mines' installations in order to learn techniques of raising metal output from French and North African mines. Others in the group included *Jacques Napoly*, engineer for the Société Miniere et Métallurgique de Penarroya in the Hautes Pyrénées, France (lead and zinc mine); *Henri Lapeyre*, general secretary of the Mining and Metals Employers' Association; *Pierre Sentous*, mine superintendent, and *Maurice Soulie*, engineer, Compagne Royale Asturienne des Mines (lead) of Morocco and Tunisia.

DEAN CHARLES F. PARK JR. of the Stanford School of Mineral Sciences, Stanford, California, U.S.A., is on a three-month trip to Japan assisting General MacArthur's staff in the modernization and rehabilitation of the Japanese mining industry. Dean Park, a recognized expert on ore deposits, will be attached to the mining and geology division of the Natural Resources Section of MacArthur's headquarters.

Enrique Normand, who represented Peru at the Trade Agreement Negotiations at Torquay, England, at the end of the year, has returned to Lima, Peru.

Rear Admiral Oberlin C. Laird (retired) of the U. S. Navy, has been appointed director of public relations for U. S. Steel Corporation's subsidiary, the Orinoco Mining Company, which operates in Venezuela. He had been with U. S. Steel's export division for a year and is now at Caracas in his new position.

Joel A. Mirel is on a trip to Japan and other Far Eastern countries to study metal and ore supplies. He is with the Mercantile Metal & Ore Corporation of New York.

Robert Maynard, export manager of the Thew Shovel Company, has returned to Lorain, Ohio, U.S.A., after a 47,000-mile, 'round-the-world flight, during which he visited 16 countries. At the end of a flight from Rome to Johannesburg, at an altitude of 16,000 feet, Mr. Maynard descended 9,000 feet to the bottom of the world's deepest gold mine. He went to an average of two cities in each country visited, calling on 18 Thew distributors and many owners of Thew-Lorain shovels and cranes in the mining, construction, and other material-handling fields. His longest stay was in Australia where Thew Shovel has a licensed manufacturer of Lorain products.

Dr. Santiago Vera Izquierdo, 37, was appointed Minister of Venezuela's newly created Ministry of Mines and Hydrocarbons. He is a graduate of that country's Central University, and has a B.S. from the University of Oklahoma, and from 1944 to 1948 was professor and subsequently president of Central University. He has been a Counselor of the Venezuelan Embassy at Washington, D.C., and Venezuelan Minister to Switzerland and Austria. He is a member of the American Institute of Mining and Metallurgical Engineers and of the Venezuelan Society of Natural Sciences.

Sir George R. Macfarlane Reid of London has been elected a director of Phoenix Prince Gold Mining Company, Ltd., which operates a 263-claim property near Bindura, Southern Rhodesia.

L. H. Lange, vice president and manager of the Galigher Company's metallurgical division, Salt Lake City, Utah., U.S.A., is in Africa acting as metallurgical consultant to several mining companies. He is a specialist on flotation and ore dressing problems. Among mines he will visit are Tsumeb Corporation's lead, zinc and copper properties in Southwest Africa, copper mines in Northern Rhodesia and Uganda, and a French Moroccan lead-zinc operation.

W. E. Sinclair, mining engineer, resigned as general manager of the Cape Asbestos Company (Cape Blue Mines), South Africa, last year, and after an extended tour of the mining areas of East Africa has returned to set up a consulting practice at Johannesburg, South Africa.

Edward P. Leach, La Sernas, Chile, vice president and manager of the Bethlehem Chile Iron Mines Company, has returned to Chili after a trip to Duluth, Minnesota.

James Parnell Caulfield has become general manager of the Utah Copper Division of the Kennecott Copper Corporation, Salt Lake City, Utah. He had been general superintendent of the Hudson Bay Mining and Smelting Company, Ltd., and general manager of the Hudson Bay exploration and Development Company in Canada. He is a native of Butte, Montana.

J. NIXON BEWSHER, consulting engineer of London, England, who has been at Cobalt, Ontario, during the past year, is now in India doing consulting work in connection with cobalt production and chemical and metallurgical works development. He expects to stay in India several months and hopes also to renew old acquaintances while there—his address is c/o Lloyds Bank, Ltd., Hornby Road, Bombay, India.

J. Fred Johnson, manager of operations, western mining department of the American Smelting & Refining Company, has been in Nicaragua and Guatamala on business.

Alex Shaak, former superintendent of Kelowna Exploration Company at Hedley, British Columbia, is now general manager of Cariboo Gold Quartz Mining Company at Wells. He succeeds *G. A. Gordon*.

Arnold Payette of Timmins, Ontario, Canada, has been appointed sales and service representative in Bolivia, Chile and Peru for the Mine Safety Appliance Company's International Division. His headquarters will be at Lima, Peru.

Larry T. Postle has resigned as mine manager of East Sullivan Mines, Ltd., Val d'Or, Quebec, Canada, and has become vice president and general manager of Granby Consolidated Mining, Smelting & Power Company, Ltd., Copper Mountain, British Columbia.

H. A. Lavers has been named metallurgist for the Colonial Development Corporation. He will maintain headquarters at London.

Comar Wilson has succeeded *S. S. Taylor as* chairman of the board of The Consolidated Mines Selection Company, Ltd., London. Taylor will continue as a director, however.

C. E. Meyer was appointed chief of the Economic Cooperation Administration's Special Mission to Austria, according to *William C. Foster*, administrator of ECA. Meyer, who succeeds *Clyde N. King*, resigned, formerly was vice president of Standard Vacuum Oil Company and since December had been chief of ECA's Mission to Korea. *William G. Colman*, deputy chief of the Korean mission, is now its acting chief.

T. Pryor, chairman of the South Kalgurli Consolidated, Ltd., with offices at London and property on the Golden Mile, Western Australia, recently visited the property and will visit properties in the Eastern States, including the Mysore Gold Mining Company of India before returning to England. He is a director of the Mysore company.

Ernesto L. Graham has resigned from the Mazapil Copper Company staff to join Cia. Metalurgica Penoles, S.A. His address is Torreon, Coahila, Mexico.

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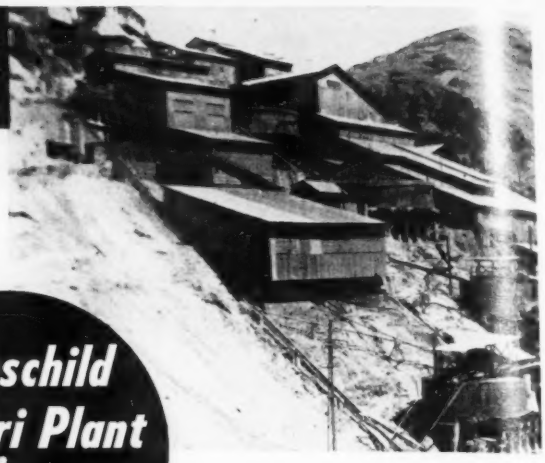

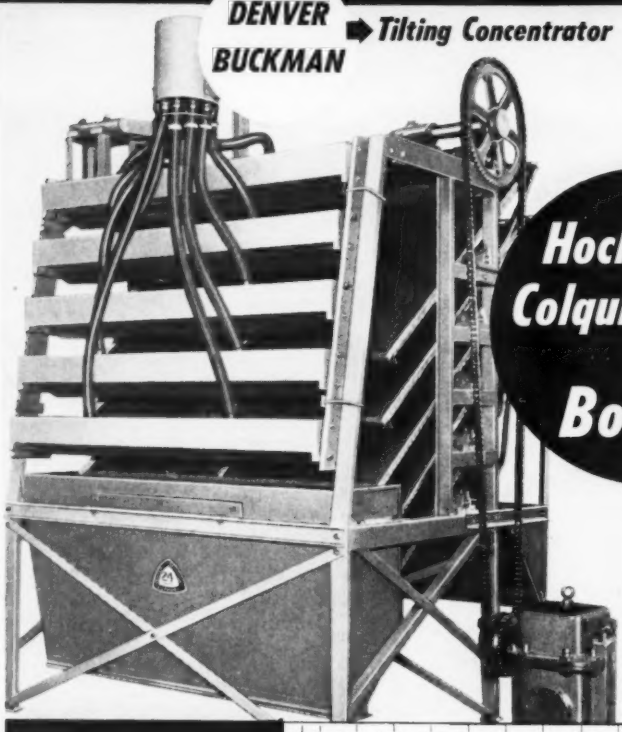

Hochschild Colquiri Plant in Bolivia recovers 15 tons per month at a cost of only 7c per ton milled

(Quoted from November 1950 Mining Engineering)

"The tests reported in this paper indicated a tin recovery of 42 pct. The actual plant results for 1949 show a 54 pct. tin recovery from the Sullivan (Denver-Buckman) decks.

"The total average quantity of tin produced from the S deck section in 1949 was 15 tons of tin per month. This corresponds to 3 pct. of the total mill recovery.

"The operation of the whole slime plant in Colquiri including flotation and fine sand tailing, cost $0.07 per ton milled.

"In the year 1949 only $317.00 was spent for spare parts and material for the Sullivan decks in Colquiri with a total of 268,600 tons milled."

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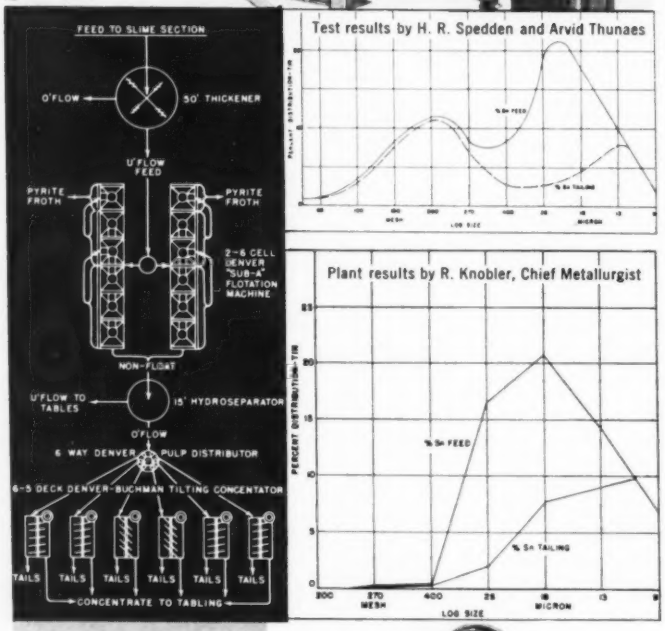
Denver-Buckman Concentrators are available in half sizes for laboratory pilot plant work, or the testing can be done by Denver Equipment Company Ore Testing Division on a cost basis.



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INTERNATIONAL NEWS

Russians to Supervise Albanian, Romanian Mines

Russian officials are said to be arriving in Albania and Romania in order to set up supervision of output at and development of mines in these countries.

In Albania a Russian official mining mission arrived in the course of the past few weeks to review the present mining situation and to organize a modern mining department within the Albanian Government Organization. The department is to be managed for the next two years by Colonel Simonoff of the Russian Mining Service of the Russian Army. The mission has been charged to investigate particularly reports regarding the discovery of chrome ores in the Kukes zone in the Drin river valley, and the alleged discovery of uranium ores in the Debar zone on the Albanian-Yugoslav frontier. Though no information has been published on this subject in the Albanian press, the fact that the whole Debar district has been placed under supervision of Russian army officers should be an index that something has been found. In the meantime the whole chrome ore output of the zone of Korca is being shipped to Odessa from the port of Valona.

In Romania mining activities are being placed under the supervision of Russian mining officers. The Romanian output of iron ores, which had grown from 108,000 tons in 1936 to 550,000 tons in 1942 owing to the steps taken by the German Army Forces during the occupation of the Romanian territory, has dropped between 1948 and 1950 to 90,000 tons yearly owing partly to the persecution of miners against the Romanian Communist Government, and partly to the inability of the Romanian State Mining Department to import new mining equipment, which is much needed.

Canadian Iron Attracting More U. S. Steel Firms

Acting for the Bethlehem Steel Company, the Youngstown Sheet and Tube Company, The Steel Company of Canada, Ltd., and the Interlake Iron Corporation, Pickands Mather & Company of Duluth, Minnesota, is negotiating with Steep Rock Iron Mines, Limited, an agreement to explore and an option to lease certain iron ore property in the Steep Rock Lake area in Western Ontario, Canada. The announcement was made by Elton Hoyt, II, senior partner of Pickands Mather.

Mr. Hoyt said that while details of the agreement are still to be worked out, plans are going forward to begin in the near future a program of exploratory work. If sufficient ore should be proved, the company taking the lease will be managed by Pickands Mather & Company. He declined to discuss any tonnages but said it is hoped that the project will disclose deposits of some magnitude.

The property being optioned covers more than 1,000 acres and is in the general vicinity of property which Inland Steel Company of Ishpeming, Michigan, optioned from Steep Rock Iron Mines a year ago and is now exploring. The area controlled by Steep Rock lies about 140 miles west of Port Arthur and Lake Superior, and is connected with Port Arthur by rail.

Cerro de Pasco to Build Zinc Refinery in Peru

The loan of up to a maximum of $20,800,000 by the Export-Import Bank to the Cerro de Pasco Copper Corporation will mean that the company will turn out 70,000 more tons of zinc annually at its Peruvian works.

The money will be used to construct a new hydro-electric plant on the Paucartambo River, on the eastern slope of the Andes, to expand concentration facilities at Cerro de Pasco and to erect zinc refining facilities at La Oroya. Peru at present has no refined-zinc plants except a pilot plant which Cerro de Pasco operates. The new plant will have a 200-ton per day output—70,000 tons yearly.

New Company to Construct $100,000,000 Steel Plant

A new steel company has been formed to build a $100,000,000 steel plant on a 900-acre site along the Trenton, New Jersey, river front. The company, which hopes to start operations in 18 months, has been named the Gibraltar Steel Corporation. Announced as chairman of the board is Cyrus Eaton of Otis & Company, Cleveland, and chairman of the board of Canada's Steep Rock Iron Mines. President is Max Zivian, president of Detroit Steel Corporation. Vice president is Carlton M. Higbie, Detroit financier.

In the first year of operation the company hopes to produce 800,000 tons of ingots; thereafter production is expected to be 1,600,000 tons annually. The mill site has 5,000 feet of frontage on the Detroit river and reports say that 2,500 feet of river bed will have to be dredged to permit ore ships to reach the mill. About 1,000,000 tons of ore per year will come from Steep Rock.

The company has applied to the Reconstruction Finance Corporation for the loan of a major part of the money needed.

ECA Aiding Copper-Lead-Zinc Search in Africa

Copper, lead and zinc for United States stockpiling may be obtained in French Equatorial Africa under a new exploration program financed with Marshall Plan aid.

The Economic Cooperation Administration has advanced $1,855,000 and the equivalent of $2,385,000 in French counterpart francs to the Mid-African Exploration Company, a subsidiary of Newmont Mining Corporation of New York City, and to Mid-African's associated French companies, Explorations Minieres au Congo and Societe Miniere du Niari. The Marshall Plan funds will be repaid in shipments of metals to the U.S. stockpile in the event that exploitable deposits are discovered and developed.

The areas to be explored are located in the Niari Basin, in the Middle Congo region of French Equatorial Africa. Copper mining was started on a modest scale in 1911 in the Mindouli area. Up to 1930, the mines produced about 10,000 tons of ore annually but were abandoned shortly afterward because of tremendous transportation difficulties and the world-wide depression. The problem of transportation was solved in 1939 when the Congo-Ocean railway, linking the capital city of Brazzaville with the port of Pointe Noire, went into service. More recently, deposits of lead and zinc have been found in the Niari Basin, and one small lead-zinc mine currently is being operated by a French company. These mines will be the subjects of exploration.

Italy to Spend Billions Of Lires on Mining

Recent mining plans of Italy include two ambitious projects: first, the spending of a reported 10,000,000,000 lire to speed up mining research in southern Italy; and second, the spending of 15,000,000,000 lire to modernize and expand the sulphur mines of Sicily, Marche and Campania.

In the first project, prospecting will be carried out in the provinces of Potenza, Matera, Cosenza and Catanzaro in hopes of finding ores to replace foreign imports, such as iron ore which is said to exist in commercial quantities in these provinces. Also the modernizing of the Mountain Gargano bauxite mines is planned. These mines now yield only 150,000 tons of bauxite yearly. By the purchase of new machinery from Germany the output will be raised, it is hoped, to 250,000 tons annually.

The sulphur mine program envisions an expenditure of 9,000,000,000 lire for mine development and 1,000,000,000 lire for exploration. Mine operators also have applied for machinery worth an additional 5,000,000,000 from Italy, England, Germany, and the U.S. They hope to receive some E.C.A. aid from the U.S. besides. Coordinator of the entire program is the Ente Nazionale Zolfi.

To give impetus to the latter program, the British reportedly have applied to the Sicilian Regional Government for a sulphur mining concession in the Licata district and have offered to build roads between the sulphur districts and the port of Licata, from which production is exported.

Aluminum Company to Build Arkansas Plant

The Aluminum Company of America has announced it will build an alumina plant on a 200-acre site near Bauxite, Arkansas, adjoining the bauxite mines run by its subsidiary, Alcoa Mining Com-

pany. Another subsidiary, the Aluminum Ore Company, will operate the plant.

The Aluminum Company said plans for the plant are being completed, orders for materials are being placed, and about 1,000 men will be employed when plant and housing construction is finished. The plant will process low grade bauxite ore from the Alcoa mines and will increase the company's yearly alumina production by almost 50 percent.

During World War II Alcoa developed a special combination lime, soda-bayer process for treating low grade bauxite which makes its use economical.

EUROPE

ENGLAND—To avoid an aluminum shortage, a 20-year contract has been signed by the British Ministry of Supply and the *Aluminum Company of Canada* providing for shipment of 200,000 tons of virgin aluminum per year from the Aluminum Company. In return, Britain will postpone for 20 years repayment of funds advanced to the company during the war for expansion and will lend a further $25,000,000 for more expansion.

SPAIN—Final tabulation was expected to show that lead production in 1950 was up 33 percent from 1949. Although antiquated facilities and restrictions in electrical power plague lead mining in Spain, there were enough new plant installations to eliminate some of the treatment bottlenecks and allow increased production.

ITALY—Quicksilver deposits, thought to be extensions of the *Idria* mines, deposits in the Yugoslav zone north of Trieste, have been discovered between Gorizia and Cividale along the frontier. Italo-British mining interests have made offers to the Italian Government to take over exploitation of the deposits.

ENGLAND—Reports regarding tin say that a pilot plant may be installed at the *Beach Tin* property near Hayle and that additions are being made to the *British Malayan Tin Syndicate's* Basset property.

GERMANY—Another uranium discovery, said to extend 100 kilometers southeasterly from Amberg, northern Bavaria, to the Czechoslovakian border, is reported to have been made last summer. For "political" reasons the announcement was held back until recently.

ITALY—The *Montecatini Company* has discovered zinc deposits near Bolsena Lake and expects to erect a plant near the site. When the mine is producing the estimated yearly output will be 9,000 tons.

IRELAND—*Benbulben Barytes, Ltd.*, is reopening its mines on Benbulben Mountain in Co. Sligo, according to A. G. Jennings, general manager and secretary. He also said the company planned extensive production of fertilizer, using present grinding facilities at Sligo to manufacture ground rock fluorspar. Large shipments of crude phosphate to the company's factory via Sligo Harbour will soon be facilitated by the recently announced plan to dredge the harbor. The company is said to be negotiating with a continental fertilizer firm for its aid in the project.

FRANCE—Bismuth production at the Salsigne plant, which resumed operations last August after a shutdown of several years, has been averaging from four to five tons per month. Nickel production from a Havre refinery increased from 90 to 120 tons monthly in 1949 to between 450 and 550 tons monthly recently.

ENGLAND—In North Wales some lead-zinc and gold-bearing lodes are to be reopened in the Mawddoch valley, Dogelly. According to reports the *Trecastell* mine in the Conway valley, Caernarvonshire, and the *Parc* mine at Llanwrst, Denbigshire, also are being reopened.

ITALY—Uranium has been found in the Saint Vincent area (Aosta Valley), and Italo-French interests have applied to the Government for a concession for exploitation. However, the Mining Department of the Italian Ministry for Industry is considering Government control of all radio-active ores and very likely will back no private development plans.

FRANCE—After six months of slackened activity, in November tungsten production from the Montmins mine and plant was doubled and the resumption of tungsten production from the Puy les Vignes mine is expected very soon. At the latter active underground work is in progress and additions to the plant are being made.

ENGLAND—In Cornwall, operations at the *South Crofty* mine have suffered several setbacks. One side of the 48-ton, cast-iron beam of the Cornish pumping engine at the New Cooks shaft broke in two and is so badly damaged it cannot be repaired. The accident has caused the flooding of the lower part of the mine. Emergency pumping equipment is being installed and is hoped to be capable of handling the water until the new permanent electric pumping plant can be completed, about two years hence. Operations have stopped in the Cooks section and a limited amount of ore is being hoisted from the Robinson section where bailing tanks are in use at the shaft at night. Meanwhile repairs and installation of vanners and tables destroyed in a fire in the concentrating plant recently are underway.

LATIN AMERICA

JAMAICA—*Kaiser Aluminum & Chemical Corporation* has several engineers investigating bauxite deposits at Mandeville where the company expects to set up mining operations when the many details are worked out. So far investiga-

FRENCH MINING DELEGATION WELCOMED IN THE UNITED STATES

The American Prospectors and Developers Conference sponsored by the Colorado Mining Association and affiliated groups welcomed the 16-man, French mining-study team to the United States at Denver, Colorado, on February 2, 1951. Shown here is J. Coineau, interpreter, reporting the speech of Henri Lapeyre, Paris, France, general secretary of the Mining and Metal Employers Association, to the 1,500 men and women in attendance at the Colorado Association's Gold and Silver Banquet. Toastmaster Frank H. Wardlaw, Jr., had told the group previously that this was a good will meeting similar to that recently made by General Eisenhower in Paris, and the goal of all was world peace. Lapeyre is standing slightly behind Coineau. Also shown are, sitting from left to right, Otto Herres, Defense Minerals Administration, Washington, D.C.; Blair Burwell, Colorado Association president; Mrs. Robert S. Palmer; and Dr. C. E. Dobbin, U. S. Geological Survey.

tions are not sufficiently advanced for company officials to estimate the size of eventual operations or their nature. However, when mining begins, the bauxite will be sent to the company's alumina plant at Baton Rouge, Louisiana, for treatment.

PERU—A large manganese deposit found in Carabaya province is to be exploited by the new company Corporacion Peruna de Manganeso. Samples sent to the U.S. were said to contain 60 percent Mn. and very little phosphorus.

BOLIVIA—Another manganese mining firm recently formed is the *Cia. Explotadore de Manganeso de Tarapaca*. It will mine deposits near Alcerreca, between Arica and La Paz.

BRAZIL—Since the last war there has been an increasing interest in the Brazilian production and exploration of rare-earth minerals. From a report by Engineer Mario da Silva Pinto, director of the National Department of Mineral Production the following information was gained: 1) Very little is known about Brazilian deposits of uranium, thorium, and beryllium ore; 2) several published reports show, however, that there is a possibility of Brazil being, in time, a large producer of radioactive ores; 3) the black sand deposits of Espirito Santo State were estimated to contain around 50,000 tons of monazite. The monazite produced in this state is being treated at two plants at Sao Paulo, State of Sao Paulo, where the thorium oxides are being stored. Plans to investigate the monazite deposits in the States of Bahia and Rio de Janeiro are being made.

HAITI—The *East India Company, Inc.*, expects to begin copper production at its Grande Riviere du Nord property by about the middle of the year at a rate of 250 tons monthly, gradually increasing to a possible 500 tons monthly, according to Dr. Felix Ochs, consulting mining engineer. At present the property is in the prospect stage and no reliable estimates of available tonnage can be made, except that there are probably a minimum of 10,000 tons of ore. Exploration and development has been confined to the surface except for a few shallow pits and trenches, but these have uncovered a series of veins and oreshoots of workable width and containing several thousand tons of copper ore which can be developed and mined immediately. The company has explored only a small section of a large concession in a completely uninvestigated area of Haiti, so that the prospect of adding reserves appears excellent. According to engineers, the copper-bearing deposits of the district consist of several systems of fissure veins varying in width from a few centimeters to half a meter and probably more at depth. Maximum length has not yet been defined, but some veins indicate a strike length of 100 meters. The veins occur in basalt and andesite and the chief copper minerals are the secondary ores, chalcocite, bornite, covellite, malachite and azurite. They often occur as rich shoots of massive ores. The principal gangue minerals are quartz and calcite.

MEXICO—A group of United States geologists are reported to be surveying the Mexican mining zone of Concepcion del Oro in the State of Zacetecas. The report, as yet unconfirmed by the Mexican Government, said the geologists, travelling by jeep, are exploring the region for strategic metals needed in the U.S. armament program.

BRAZIL—*Volta Redonda, National Steel Company's* big steel mill, produced 300,000 tons of steel in 1950, an increase of about 75,000 tons over 1949, and an estimated 50 percent of total Brazilian steel production, i.e., 600,000 tons. By 1952 the country will consume 1,000,000 tons of steel, if present increases continue, and even though existing steel mills increase production in proportion to Volta Redonda's, only 90 percent of expected requirements will be met.

CUBA—The *Mining Equipment Corporation* will operate the *Nicaro* nickel plant in Oriente Province, after the U.S. Government spends $5,000,000 in the next nine to 12 months to put the plant in operating shape, and to add facilities for the recovery of cobalt, using a new process. The plant is said to have a rated capacity of 30,000,000 pounds of nickel oxide annually, all of which will be used or stockpiled by the U.S. The property consists of 1,133 acres on which are rail and port terminals, a metallurgical plant, mining facilities, and a town with 400 buildings, all built for about $32,000,000 during World War II.

CUBA—The *Cautillo Mining Company* is planning to double production in 1951, according to reports. The company runs the *Charco Redondo* mine, producing metallurgical-grade manganese.

ARGENTINA—Discoveries of galena deposits in Chaschuil have been reported and exploration is said to be in progress. Intensified exploration for lead and zinc in Catamarca province also is under way. The sulphide lead and zinc ores will be used to produce blending acid for the *Sulfacid Compania S. A.* and leaching acid for the zinc refinery at Comodoro Rivadavia.

BRAZIL—Although zirconium is a widely distributed element, natural concentrations of it are rare. In Brazil zirconium occurs in commercial deposits either as zircon ($ZrSiO_4$) or as baddeleyite (ZrO_2). However, the most important deposits are those located in the Pocos de Caldas region, where reserves are estimated to be 2,000,000 metric tons and where zirconium is found as baddeleyite. The zirconium oxide, usually of botryoidal character, occurs in veins in the enclosing rock. Ore can mined in place, i.e., where zirconium oxide was precipitated hydrothermally; or in placers, where the botryoidal and rounded pieces were concentrated by water. Zirconium oxide (baddeleyite) from Pocos de Caldas contains some hafnium, which is not worth extracting. Mining operations have been increasing since the invasion of Korea, and the Export-Import Bank is considering a loan to zirconium mining firms for further increases.

MEXICO—Mining activity in the State of Queretaro is increasing as a result of higher metal prices, according to the State Mining Agency. It revealed 18 new claims were filed last November and 15 in December. The properties center in the Cadereyta de Montes and Toliman zones, where silver, lead, zinc and antimony are produced.

CHILE—After dropping considerably in September, mining production increased 23.8 percent in October and reached the highest level in the past 19 months, according to reports. Continued high levels are forecast for 1951.

BRAZIL—A recently printed table, reprinted below, shows the extraordinary rise in U.S. imports of Brazilian ores in a two-month period alone:

	September	*October*
Sisal Fiber	$188,650	$940,682
Iron Ore	482,300	649,762
Manganese Ore	153,520	352,471
Tungsten Ore	57,528	190,070
Beryllium Ore	17,190	76,213
Mica	101,000	133,208
Quartz	33,635	90,200

MEXICO—Two Mexican government geologists are making a detailed study of a swamp near Chilpancingo, State of Guerrero, the mud of which recently yielded a number of shiny nuggets resembling diamonds. The local government mining agency also is studying the samples. So far, however, no results have been announced.

COLOMBIA—BRAZIL—Both of these countries are working on their stockpiling programs for critical raw materials. Colombia, several months ago, stated that $25,000,000 would be spent for its program (in foreign exchange). Brazil estimates that such a program will cost her $250,000,000.

BRAZIL—Brazil is now producing considerable amounts of phosphate rocks from her deposits. The *Ipanema* mine, State of São Paulo, the greatest apatite-producing camp in Brazil, produces ore running six to eight percent in apatite. In *Jacupiranga*, in the State of São Paulo, occur large workable deposits where the phosphate makes up 22 to 25 percent of the whole. The production of phosphate in this mine in 1949 was 17,901 metric tons. In the same State, at Morro do Serrote, occur very important phosphate rock formations. These deposits, which were discovered recently, are formed by primary and secondary minerals, having the same character of the Marocco ore. The reserve was estimated to be 500,000 metric tons of ore containing 25 percent P_2O_5. Another deposit of phosphate rocks was recently discovered at Araxá, State of Minas Gerais and is considered to be the largest of all in Brazil.

AFRICA

SOUTHWEST AFRICA—The *Krantzberg Mines'* tungsten property near Omaruru will be reopened, according to an announcement from the parent company, the *Associated Ore and Metal Corporation*, of the *Anglo-Transvaal* group. Additional plant equipment has been ordered and production will start in the second half of this year.

SOUTHERN RHODESIA—The Chamber of Mines of Rhodesia and the Rhodesian Mining Federation are considering the establishment of a gold refinery in Southern Rhodesia, and a joint standing committee is going into details of the proposed scheme now. Rhodesian mines are said to be paying more than £80,000 a year in refining fees and assay charges. A native refinery probably would not only keep the money in the country but also would cut charges to Rhodesian mining companies. The proposal is that the necessary capital should be raised locally and the refinery should be run by private enterprise. The producing companies are also seeking permission to sell their gold direct to London instead of being compelled to deal with local banks.

ANGOLA—Copper exports in the first nine months of 1950 were 1,599 tons compared with 210 tons in the same period of 1949. To cut shipment prices a furnace has been constructed at Mavoio, Angola, to treat the ore before it goes to Portugal. Further increases in copper production are expected since Portugal's needs are continuing to expand.

SOUTHERN RHODESIA—The *Kamativi* tin mine near Wankie has been reported sold to the Oakes Trust of the Bahama Islands for a sum between £100,000 and £170,000.

SOUTH AFRICA—The *Stilfontein Gold Mining Company's* property in the Klerksdorp area extends over 5,560 claims, of which an estimated 5,100 claims are underlain by reef. Shaft sinking at the mine has been in progress about 19 months. The Margaret shaft, the first in the Union to be equipped with a reinforced concrete headgear, had reached a depth of 1,071 feet by the end of December and had entered lava at a depth

of 883 feet. One 3,000 hp. winder was put in operation in January and a second is being installed. The Charles shaft, with steel headgear, had reached the Vaal Reef horizon by the end of December at 2,402 feet, and values of 274 inch-dwts had been obtained. Excavations and preparing the foundation for the reduction works are in progress, and orders have been placed for the delivery of heavy equipment. The initial milling rate is expected to be 40,000 tons per month, rising to 120,000 and perhaps a bigger tonnage ultimately.

BELGIAN CONGO—The year 1950 was a good one for *Union Miniere du Haut-Katanga*, which produced 176,000 metric tons of copper compared with 141,000 in 1949 (when the output was affected by power shortage), and 155,000 in 1948. A new power station at Centrale Bia came into operation and the extra power available enabled the production of electrolytic copper to reach a record figure and also increased the output of cobalt. Other additions to plant and capacity enable output to increase in all departments and copper production in 1951 may be in excess of 200,000 tons.

SOUTH AFRICA—The directors of *South African Manganese, Ltd.*, have announced that a supply of low grade ore, previously unsaleable, has been included in long-term contracts with overseas buyers. The demand for all grades of the company's ores is continuing, and the company policy will be one of increasing production.

NORTHERN RHODESIA—The *Roan Antelope Copper Company* has decided against moving its head office from London to Northern Rhodesia to escape heavy taxation. The company felt that tax savings at present in Rhodesia might prove to be only temporary.

ALGERIA—France and Italy are said to be negotiating for the possible shipment to Italy of Algerian iron ore.

SOUTH AFRICA—*Rustenburg Platinum Mines, Ltd.*, one of the world's major producers, sold platinum group metals to the net value of £1,055,576 in its last financial year, at the close of which stocks of platinum and other metals were valued at cost at £1,121,580. Transfer was effected during the financial year of the mineral lease, precious metal claims and freehold property acquired from the *Union Platinum Mining Company, Limited*. Installation of the new plant was completed during the year, and crushing is reported to be at full capacity, namely, over 70,000 tons per month, including the tonnage being milled at the recently completed reduction plant at the newly acquired Union Platinum section. The smelting furnace was rebuilt early in 1950 and can now handle the output from the two reduction plants on the properties.

ANGOLA—The only diamond mining company in Angola is the *Société Diamants de l'Angola*, which recovers, from alluvial deposits at Luanda, between 750,000 and 800,000 carats per annum. The property is equipped with washing plants, a pilot HMS plant and a small electrostatic separation unit which is being tested now. During 1951 the company expects to be operating eight mechanical excavators.

ETHIOPIA—The *Industria Mineraria Italiana Societa per Azioni* of Milan, Italy, is negotiating with the Ethiopian Government for exploration permits on iron-bearing land along the Anglo-Egyp-

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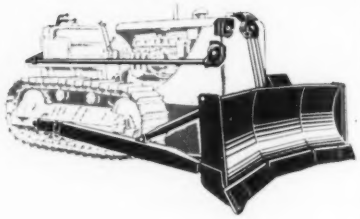

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tian Sudan frontier. Unconfirmed reports have been made that 50,000,000 tons of iron ore exist here.

TANGANYIKA—*Uruwira Minerals, Ltd.*, the pilot plant of which has been producing 280 metric tons of lead-copper concentrates per month, estimates that by 1952 about 1,500 metric tons of mined ore will be hoisted per 24 hours, and 700 tons per 24 hours fed from the differential density plant to the flotation section. By then, capital expenditure is expected to be as follows: differential density plant £150,000; flotation section £300,000; water supply £160,000; machinery, buildings, equipment, etc., £17,000; engineering and contingencies £153,000; working capital at production date £100,000; and if a smelting section is erected, the additional cost is likely to be £300,000. The mine is in the Mpanda district.

SOUTH AFRICA—At *St. Helena Gold Mines, Ltd.*, in the three months to December 31, the footage sampled on Basal Reef was 1,690 feet of which 1,105 feet (or 65 percent) were payable, averaging 376.8 inch-dwts. The *Messina (Transvaal) Development Company, Ltd.*, reports that total ore output in the three months to December 31, 1950, was 149,390 long tons with a recoverable copper content of 2,485 long tons.

SOUTHWEST AFRICA—*South African Minerals Corporation, Ltd.*, is now producing from 28 of its 68 claims in the Okahandja district and recent exploration has proved that known deposits are more extensive than expected. One of the company's first trial shipments assayed 41.95 percent manganese, 4.93 percent iron and 12.16 percent silica, according to reports.

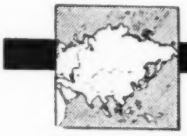
UGANDA—Development and exploration is in progress on copper and cobalt deposits in the Ruwenzori Mountains by *Kalembe* (or *Kilembe*) *Mines, Ltd.*, a subsidiary of *Frobisher, Ltd.* More than 30,000 feet of drilling and 10,000 feet of underground development have been advanced since the concession was granted in 1946 by the Uganda Government. The concession covers about three square miles; 45 Europeans and 1,000 natives currently employed. Production will depend on development results.

EGYPT—The discovery of a manganese deposit in the Sinai area recently has been reported.

FRENCH EQUATORIAL AFRICA—The *Cie. Miniere du Congo Français* in cooperation with the Bureau Minier de la France d'Outre-mer will do detailed geological surveying and drilling in the Mindouli and Boko-Songo region. They hope to discover workable copper deposits. Actual exploitation of old copper mines 180 miles inland from Pointe-Noire harbor is planned, according to a report from Brazzaville, although by whom the work would be done was not mentioned. The mines were worked from 1905 to 1930 when the world situation closed them.

SOUTHWEST AFRICA—Prospecting for and mining of beryl and tungsten are increasing, with the search for beryl shifting from south to north because of the exhaustion of known orebodies in the south. The price increase in tungsten from £280 to £1,440 has intensified its production considerably.

MADAGASCAR—The creation of a "mining credit bank" is being considered by the High Commissioner in order to assist small and medium operators to expand operations or modernize existing equipment and machinery.



ASIA

INDIA—A reserve of chromite containing an estimated 200,000 tons of ore has been discovered by the Geological Survey of India at Naushahi in the Keonjhar district of Orissa State. A preliminary examination has also indicated possible reserves of 500,000 tons of magnetite.

TURKEY—The Turkish Government is negotiating with German mining firms for the exploitation by the latter of several copper mines in the Erganie Maden area. The agreements would be for ten-year periods and would stipulate that the mines be re-equipped with modern machinery, the cost of which would be repaid through profits.

BURMA—Tin, lead and wolfram are among the minerals which have been given priority under the Burma Government's scheme to restore the war-shattered economy of Karenni State. Further north, in Kachin State, priority will be given to engineering work necessary to resume gold mining and other non-ferrous metal mining. In central and eastern Burma, uranium and thorium mining will

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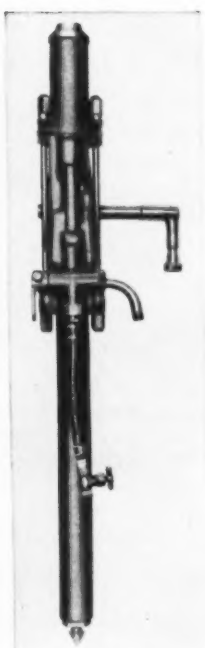

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be ...ished. The Civil Administration Au...rities, who have worked out the pri...ities, hope that, in view of the rising world prices for these metals, the country will be able to earn the foreign exchange necessary to pay for the vast quantity of goods, including machinery, electrical equipment and tools, which are urgently needed.

CHINA—The Fuel Industry Administration, Central Government, stated that coal production increased 10.35 percent in 1950 compared with the previous year. Evidently further increases will be striven for since reports from the *Yangchuan Coal Mines*, Shansi Province, say that plans have been made for production in 1951 of 800,000 tons; in 1952, 900,000 tons; and in 1953, 1,200,000 tons. The administration also said that the *Yumen* petroleum mines, Yumen district, Gansu province, had increased production 24 percent in 1950 and would continue to try to raise production.

IRAQ—In Iraqui Kurdistan near the Iranian frontier, deposits of copper and iron have been found, and plans already are being made for their development. The work will be financed through money obtained by oil sales.

SIAM—The *Bangrin Tin Dredging Company* will close down the No. 2 dredge at the end of this year, according to K. O. Hunter of London, chairman of the board. The dredge is operating in old ground which will be completely worked out by that time.

PAKISTAN—Geologists have claimed that the hilly tracts of Baluchistan contain vast quantities of minerals, including uranium. As a result mining officials of Pakistan are now prospecting certain areas with Geiger counters in hopes of finding commercial quantities of uranium.

MALAYA—*Southern Kinta Consolidated, Ltd.*, has announced that its No. 2 dredge has been operating for several months and regular production is coming from this section of the property.

INDIA—Operation of the *Bellara* gold mines and other nearby gold-bearing areas, either by the government or in association with private mining men is being considered by the Mysore Government. The Bellara gold mines, about 90 miles from Bangalore, are worked at present by the Mysore Geological Department, have been developed to a depth of 200 feet and are said to show considerable possibilities. The nearby gold areas, which the government thinks worth looking into, are at Ajjenahalli, about 12 miles from Bellara, and Jalargundi near Lakkavalli.

BURMA—Until recently aluminum manufactures were not affected by the Import Control Regulations in Burma. Now, however, the Open General License has been amended to exclude imports of aluminum manufactures with the exception of aluminum circles, sheets, wires, strips, rivets, and similar articles.

PAKISTAN—The Sind Industries Department has made a preliminary survey of iron mines in Sind near Thatta, an area some 30 to 40 miles long, extending from Jhole-Dhund (a few miles from Thatta) to the 104-mile point on the Karachi-Hyderabad road. Samples of the ore were assayed in laboratories at Punjab and were said to contain between 49 and 56 percent iron.

INDIA—Since India has little sulphur and imports of it have ceased, the Council of Scientific and Industrial Research has recommended that the Government should build a pilot plant for the manufacture of sulphur from gypsum. Gypsum abounds in the country. The Council also has decided to investigate the possibility of "tapping" copper pyrites and other such sources of sulphur for the manufacture of sulphuric acid.

NORTH AMERICA

NORTHWEST TERRITORIES—*Giant Yellowknife Gold Mines, Ltd.*'s third quarter report stated that the construction program for the year was finished before winter began and that the camp was now equipped with eight bunkhouses, seven residential units, a fire house, the C Shaft headframe was closed in and steel ore bins and waste bins erected. A warehouse was erected near the C Shaft treatment plant and at present the electrical precipitation plant is being built. Reserves at B Shaft were increased by 9,000 tons to a total of 103,600 tons.

MICHIGAN—The United States Defense Minerals Administration is considering approval of a substantial loan to the *Copper Range Company* to exploit its White Pine copper deposits. According to M. F. LaCroix the company proposes to produce about 75,000 short tons of copper metal yearly.

QUEBEC—With a stockpile of 2,500 tons of lead-zinc-silver ore from which to draw and a burned powerhouse rebuilt, *Consolidated Candego Mines* has resumed milling at its Gaspe Nord property at an initial rate of 55 tons daily. The mill rate can be increased in the future by the addition of flotation cells and a unit cell, already ordered. Two new compressors have been purchased. Development plans for 1951 include driving the No. 3 adit, now 745 feet long, another 1,000 feet, and driving the No. 4 adit 2,500 feet. Stewart Troop is president and managing director.

NEVADA—The *H. W. Gould & Company* has bought the *Baxter* fluorspar mine west of Broken Hills, Mineral County, and plans to erect a 250-ton Heavy Media Separation and flotation mill on the property. Fluorspar has been shipped from the mine by the former owner, V. S. Baxter, since 1928. He developed the mine to a depth of 400 feet along a strike length of 2,000 feet on four levels. The Gould company expects to continue mining at depth and to treat a large tonnage of ore now available from fills and dumps.

ALASKA—The *Fairbanks Exploration Company* ceased operations for the winter about Jan. 1, and, with the exception

INDIA OPENS THE FIRST METALLURGICAL LABORATORY IN ASIA

The National Metallurgical Laboratory of India, the first of its kind in Asia, was opened recently by Pandit Jawaharlal Nehru, Prime Minister of India. It is the fifth laboratory to be opened in 1950 in a chain of 11 such national laboratories which the Government of India proposes to set up in the country. This one cost $1,000,000 and was built at Jamshedpur. The laboratory will cover various aspects of metallurgical research, both fundamental and applied, and will carry out research on ores, minerals and refractories as applied to metallurgy. A technological building houses, among other facilities, ore dressing and mineral beneficiation laboratories. As there was little or no research in India in ore dressing problems before World War II, many thousands of tons of low grade ores have been left in dumps. By research in the new laboratory, engineers hope to find ways to recover these "lost" ores.

WORLD MINING

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of John Babel, ditch man and dredge fireman, most of the men left for the States. Babel said he would probably work ground he owns in the Fairbanks area, sinking holes. The *U. S. Smelting, Refining and Mining Company* worked its No. 5 dredge at Nome to December, said to be the latest date on record for a season.

MINNESOTA—By acquiring a 15 percent interest in *Reserve Mining Company*, *National Steel Corporation* joins *Armco Steel Corporation* and *Republic Steel Corporation* in their plans to develop a process for extracting iron ore from taconite in the Minnesota ore fields. Reserve Mining recently announced a plant would be built to produce 300,000 tons of iron ore yearly in pelletized form.

BRITISH COLUMBIA—*Hamil Silver-Lead Mines*, working near Ainsworth, has completed considerable extension of its main-haulage level, has proved up about 80,000 tons of ore, and hopes to install a 150-ton daily capacity mill in the near future, according to H. F. Kenward, managing director. The company is at present diamond drilling as a preliminary to establishing a new level 150 feet below the haulage level. A. St. Clair Brindle is consulting engineer, directing a crew of six men; J. R. Hanlon is mine superintendent.

UTAH—The *Chief Consolidated Mining Company*, which produces lead-zinc ore at its mines near Eureka, has applied to the government for funds so as to deepen its *Chief No. 1* inside shaft to the 3,000-foot level, 300 feet below the present bottom. Heavy pumping equipment and hoisting machinery will be needed. The company also hopes to start work in the *Evans*, *Apex* and *Plutus* sections of the property and to start exploration in the *Water Lilly* area, all of which will also require further funds. During the last war the company was able to open long-flooded areas of the mine and reach good ore through government aid.

ALASKA—Three lode location notices have been filed by Raymond E. Krautter and Nils Christiansen of Old Harbor and Paul B. Hansen of Kodiak on claims on the Sitkalidak Island. They will work a gold-copper-nickel vein discovered 11 years ago on the west side of the island.

UNITED STATES—Two more magnesium plants are being reactivated by the government, the Valasco, Texas, plant, which the *Dow Chemical Company* will run again as it did during the last war; and the Manteca, California, plant which the *Kaiser Aluminum & Chemical Corporation* will run again. Combined output from these plants will be about 200,000,000 pounds in two years. Three other magnesium plants already have been reactivated by the government: one at Painesville, Ohio, one at Canaan, Connecticut, and one at Wingdale, New York. Kaiser Aluminum also has a contract with the government to produce calcined dolomite and ferro-silicon and will start up its ferro-silicon plant at Permanente, California, and its lime plant at Natividad, California, to obtain these magnesium components.

ALASKA—The *Sawtooth Mining Company*, which ceased operating about two years ago, has been reported preparing to reopen. The mine produces antimony.

BRITISH COLUMBIA—*Noland Mines, Ltd.*, during the first 11 months of 1950 washed 12,800 yards for a recovery, based on mint returns, of $21.42 per yard. Profit to the end of November, including cost-aid bonus, was $68,500. The company's placer mine is on Spruce Creek in the Atlin district, where payable widths in the channel run from 100 to 150 feet. The company opened new ground upstream amounting to 850 feet in 1950. Favorable ground probably extends about 16,000 feet upstream. A new shaft and additional washing plant are being considered for installation this year.

UTAH—Vernon R. Penrose and Mason Rankin, geologists of Helena, Montana, have been carrying on an air-borne search for uranium over southwestern Utah. Flight headquarters have been established at Hanksville and plans call for a series of flights over much of Utah. The three-place plane is equipped with a scintillometer and will be flown within 100 feet of the ground at speeds as low as 60 miles per hour.

ONTARIO—Positive reserves of gold ore at *New Dickenson Mines*, Red Lake, should last over two years at a milling rate of 275 tons per day, according to recent figures. Mill rate was raised in late January from 150 to about 250 tons daily when a new unit began operating. The erection of an extra power sub-station should allow 300-ton daily production by June. Company plans include sinking 750 feet to open four new levels (there are four now) from which to mine about a year and a half from now.

NORTHWEST TERRITORIES—Depending on satisfactory negotiations for financial backing, the *El Bonanza Mining Corporation* will reopen a silver-uranium prospect near Great Bear Lake, six miles south of the *Eldorado Mining and Refining Company's property*. The latter once owned a major share of El Bonanza's land. According to J. J. Gray, president, plans have been made to purchase a mining plant and install it at the east shaft, to be unwatered in the spring. Crosscutting on the 150-foot level to the vein followed by drifting for about 700 feet to the No. 2 shaft will be the next step. Previous to 1936, when all work at the mine stopped, 18 drill holes were put down over a 700-foot length and 17 were said to show ore.

PENNSYLVANIA—The *Bethlehem Steel Company* expects to spend $300,000,000 in the next two years to expand its steel-making capacity by 2,600,000 tons a year to a total of 17,600,000 tons a year. Expansion will take place at the company's plants at Lackawanna, New York; Sparrows Point, Maryland; Bethlehem and Johnstown, Pennsylvania; and Los Angeles, California. The iron ore necessary to maintain increased steel production will come from the company's Venezuelan project, and from increased output at its U. S. mines.

ALASKA—The *U. S. Lime Products Company* has leased property at Edna Bay from which limestone will be sent by

barge and tug to Portland, Oregon, for processing in a new $1,500,000 plant the company expects to construct soon. The plant will employ about 400 men.

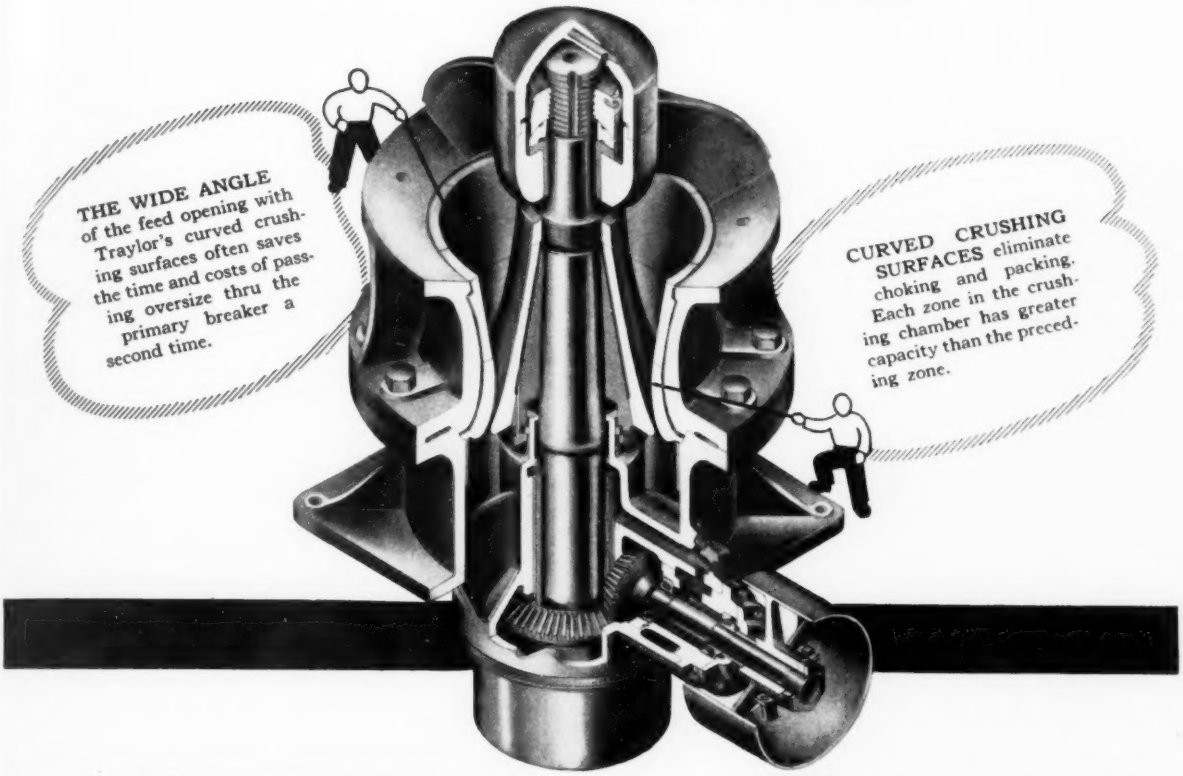
BRITISH COLUMBIA—*Estella Mines, Ltd.*, plans to begin lead-zinc production this summer at an initial rate of 150 tons daily; and machinery for a concentrator of 220-tons daily capacity is arriving at the mine in the east Kootenay region, 20 miles northeast of Cranbrook. The mine was developed by about 3,000 feet of underground workings 50 years ago, but little further work was done in the intervening time until last summer when Estella took over. The company started diamond drilling and lengthening the Estella adit, which had been driven 1,000 feet by old operators and stopped 60 feet short of the main vein. A second adit, the Rover, is 150 feet above, 880 feet long and explores the vein most of that length.

MICHIGAN—From an Ishpeming mine of *Cleveland-Cliffs Iron Company* and Crystal Falls mines of the *Republic Steel Corporation*, 20 carloads of iron ore were shipped to Norway for experimental use in Scandinavian mills. The shipments were scheduled to arrive there at the end of last month.

ALASKA—The Skagway-Haines area may become the site of from one to three aluminum plants if plans of the *Aluminum Company of Canada*, the *Aluminum Company of America*, and the *Reynolds Metal Company* should materialize. According to the Alaska Development Board, to establish an aluminum reduction plant and necessary housing at Skagway would cost about $300,000,000. The building of titanium reduction plants, iron, lead, zinc and copper smelters in connection with the aluminum industry would cost an additional $400,000,000.

QUEBEC—Reopening of the Weedon copper mine, 30 miles northeast of Sherbrooke and idle since 1921, will be un-

a Traylor TY Reduction Crusher will nip larger rocks than other secondary fine crushers



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A "TRAYLOR" LEADS TO GREATER PROFITS

dertaken by the *Weedon Pyrite and Copper Corporation, Ltd.*, recently formed for the purpose, with Roy Robertson as president, Gordon MacDonnell, vice president and Alan Cockeram, Gerald McTeigue and J. M. R. Corbet as directors. The company plans first a geophysical survey, then diamond drilling and then will unwater the mine. The main orebody, containing massive copper and iron sulphides, is 500 feet long and between 20 and 40 feet wide. An inclined shaft to 800 feet depth was sunk by old operators; underground workings extend not more than 300 feet from the shaft, since no effort was made in the past to mine other than the highest grade ore.

IDAHO—*Lucky Friday Silver-Lead Mines Company* is now milling 100 tons of ore daily from its property near Mullan, with production coming from stopes on the 1,000, 1,200 and 1,600 levels. A recent shipment of 11 cars of lead concentrates and two cars of zinc concentrates, processed from a stockpile of 7,500 tons of ore, recently netted the company about $170,000.

BRITISH COLUMBIA—J. D. Ferguson, mine manager for *Guichon Mine, Ltd.*, near Quilchena, reports that the mine shaft has been sunk 300 of a projected 500 feet and that six veins have been encountered. Two types of ore exist at the property—bornite and chalcopyrite. The overall width of the six veins is said to be 60 feet, but whether enough ore exists between veins to mine the entire width remains to be seen.

TEXAS—University of Texas scientists at Austin have developed new methods for analyzing platinum metals that are expected to save U.S. industry many man-hours spent in testing. Researchers analyze four principal platinum metals by using a spectorophotometer. With the instrument they measure the intensity of light passed through a special solution in which the alloy has been dissolved, and they can determine how much light the platinum metal has absorbed and how much of the metal is in the alloy.

OCEANIA

WESTERN AUSTRALIA—The *Prothero* lead mine at Northampton has been purchased by the *Anglo-Westralian Mining, Ltd.*, from the *Hinson Brothers and Party*. This mine is unusually rich and may give good cause for the eventual establishment of a smelting plant in the area.

TASMANIA—World prices for tungsten having soared, the *King Island Scheelite (1947) Ltd.*, is now reported in a very strong position. Deposits at the mine are said to be the largest in the world—two beds of scheelite 30 feet and 100 feet thick, separated by 15 feet of hornsfels. Reserves in 1950 were 2,800,000 tons. The plant has been producing since just befor World War II and assistance during the war was given by the Commonwealth Government.

QUEENSLAND—Towards the end of this year at *Mt. Isa Mines, Ltd.*, the new concentrator and smelter are expected to be operating with an output of up to 17,000 tons of copper per annum. This amount will exceed the entire output of Australia in 1949, (13,462 tons).

PHILIPPINES—For the month of December, 1950, the *Lepanto Consolidated Mining Company*, leading copper mine of the Far East, established a new high for production. During the month the company milled 31,195 tons yielding $598,516.00 in copper and gold. This amount compares with $266,500.00 derived from 17,600 tons handled during December of the preceding year. Lepanto's expansion program was completed in June, so that operations for the year 1950 also have resulted in a life-time high production record. Total production for the year was 283,211 tons with a copper-gold valuation of $5,109,645.00.

WESTERN AUSTRALIA—A new shaft is nearly completed at *Hill 50 Gold Mine N. L.* Reserves at the mine are 200,000 tons at 5½ dwts. and should show a gradual increase with further development of the 600 and 800-foot levels.

QUEENSLAND—Production at *Mt. Morgan, Ltd.*, for the four weeks ended January 14 was 54,950 long tons containing 4170 ounces of gold and 243 long tons of copper. This is a reduced output caused by exceptionally heavy rains and the Christmas shutdown.

PHILIPPINES—Another Philippine gold producer established a new post-war record in December when *Mindanao Mother Lode Mines, Inc.*, milled 9,600 tons of ore from which the gold yield was $252,798.00. This amount compares with 6,400 tons treated and a recovery value of $88,844 for the like month of 1949. The December production figures for other leading Philippines mines was as follows: *Acoje Mining Co.* (chromite) 5,715 tons, valued at $82,217.00; *Atok Big Wedge Mining Co.* (gold) 14,260 tons, recovery value $154,755.00; *Balatoc Mining Co.* (gold) 40,145 tons with recovery value of $279,038; *Benguet Consolidated* (gold) 32,809 tons with recovery of $271,998; *Consolidated Mines* (chrome) 23,300 tons valued at $233,000.00; *Surigao Consolidated Mines* (gold) 9,534 tons valued at $131,008.00.

WESTERN AUSTRALIA—Operation of *Messrs. Russell & Sons'* concentrating plant at Napier Range, 90 miles from Derby, has begun. Rolf Reinholdsten of Northampton, the designer, who has been offered the position of manager, said that the rich surface outcroppings and plentiful water supply have resulted in a "made to order mine."

WESTERN AUSTRALIA—At *Blue Spec Mining Company, N. L.*, Nullagine, the No. 3 level east winze is at 150 feet (600 feet below surface) averaging 28.3 dwts. over 40 inches. A western drive from this winze has advanced seven feet and is said to average three ounces over three feet, still in ore. After a thorough examination, the directors state that values are improving at depth.

SOUTH AUSTRALIA—The First Ordinary Meeting 1951 of the Australian Institute of Mining and Metallurgy will be held in South Australia from May 21st through May 29th. Inspection of the plants of Broken Hill Associated Smelters at Port Pirie, of the iron ore quarries and the steelworks and shipyards at Whyalla, and a visit to the Leigh Creek Coalfield are planned.

WESTERN AUSTRALIA—*South Kalgoorlie Consolidated, Ltd.*, milled a record of 96,427 tons for the year, and 5,282 feet of developmental work and 6,018 feet of diamond drilling were carried out. Ore reserves have been maintained.

New LORAIN Stripping Boom *Casts Higher and Farther*

Here's a new Lorain shovel with a "boarding house reach"! It's the big Lorain-820 . . . with a 34-ft. boom and a 27-ft. stick with 1¾ yard dipper. It's Lorain's answer to the strip miners' needs for a shovel that will cast material onto higher spoil banks . . . dig higher overburden and handle wider cuts. Those advantages add up to lower cost-per-yard stripping.

In addition to the new, long shipping boom, Lorain-820's offer strippers other important performance advantages . . . the shock resisting hydraulic coupling . . . mobile 2-speed crawlers. The "820" is in a class all by itself, for stripping jobs.

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No engine stall; no machinery shocks; no engine loafing.

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BETTER MOBILITY...
Independent crawler 2-speed travel in both directions, climbs 30% grades, chain drive, steers either direction, oil-enclosed mechanism.

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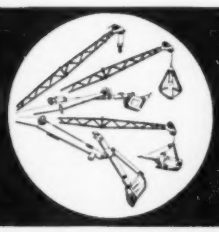

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IMPROVED SECONDARY CRUSHER: New Telsmith Gyrasphere offers new advancements in crusher design and operation. Send to MINING WORLD for bulletin Tels-274.

HOW TO SAMPLE COAL AUTOMATICALLY: Complete new booklet by Sturtevant Mill Co., Dorchester, Boston, 22, Mass., available from manufacturer or by writing to MINING WORLD.

LARGE PORTABLE AIR COMPRESSOR: Revolutionary new Ingersoll-Rand unit, weighing only 9,500 lbs. and delivering 600 cfm. free air at 100 psi. Literature available from MINING WORLD, or by writing Ingersoll-Rand, 11 Broadway, N.Y.C.

MAGNETIC SEPARATION: Complete literature on magnetic techniques. Also complete laboratory and ore testing facilities. For further information write to MINING WORLD or to Stearns Magnetic Mfg. Co., 685 S. 28th St., Milwaukee, Wisc.

HARD SURFACING METHODS: Information on increasing life and reducing wear on rolls and crusher parts obtainable by writing Resisto-Loy Co., Grand Rapids 7, Michigan, or to MINING WORLD.

SLURRY PUMPING: Literature covering operational data, design specifications for a variety of ores and materials obtainable from Morris Centrifugal Pumps, Baldwinsville, N. Y., or from MINING WORLD.

MATERIALS HANDLING EQUIPMENT: Engineering of conveyor and bulk handling equipment for mines. Literature available from Stephens-Adamson Mfg. Co., Aurora, Illinois, or from MINING WORLD.

SAND FILTER-CLARIFIER: New Bulletin on sand-filter clarifiers now available from Hardinge Co., York, Pa., or by writing to MINING WORLD.

ELECTRIC SMELTING AND REFINING: Furnace applications for matte and speiss smelting, calcium carbide, nonmetallic melting, ferro-alloys, non-ferrous refining and specialized applications. Write on company letterhead for complete book to MINING WORLD, or to Pittsburgh Lectromelt Furnace Corp., 324 32nd St., Pittsburgh, Pa.

LIQUID RHEOSTAT: Liquid rheostat type 267, which provides stepless, wide-range speed control of wound-rotor motors, is described in a new leaflet by Allis-Chalmers. Write MINING WORLD for your bulletin, "Allis-Chalmers Liquid Rheostat," 14S7544.

EARTH-MOVING: Proper zoning of heavy earth-moving equipment, with a resulting increase in both production and profit, is described in "Caterpillar Equipment Zoned for Profit," available from MINING WORLD.

ROASTING, CALCINING and DRYING METHODS: Pacific Multiple Hearth Furnace and its application to a variety of metallic ores and minerals. Literature available from MINING WORLD.

MOTOGEAR: Link-Belt Company has developed a new packaged power unit, called Link-Belt Motogear, consisting of a compact, enclosed helical gear drive and a separate standard motor, flexibly coupled and mounted on one welded steel base plate. Write MINING WORLD for Book No. 2247.

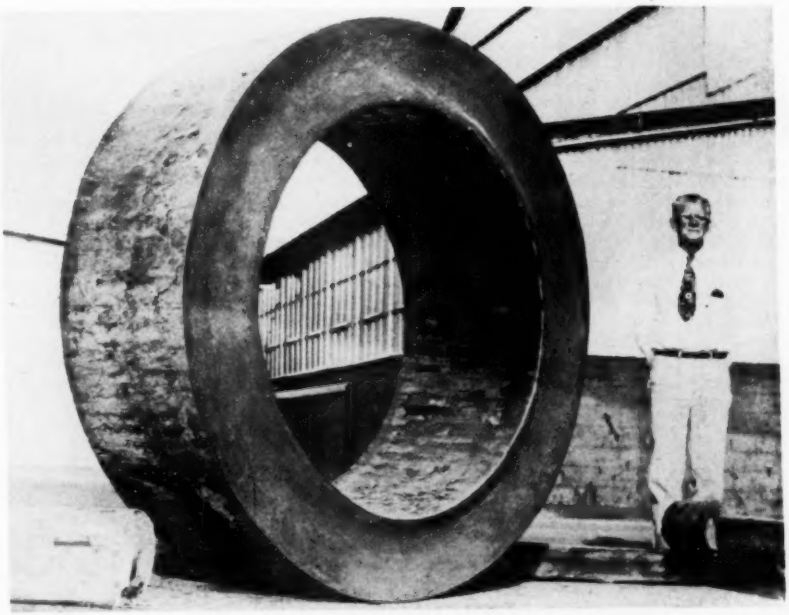
TRACTOR: A newly issued 32-page booklet describes and gives complete specifications for virtually every part of the Caterpillar D7 tractor. Get your free copy of Caterpillar Tractor Company's "Form 12678" from MINING WORLD.

RADIATION SURVEY INSTRUMENT: A new product of El-Tronics specifically designed for portable and field use in measuring radiation intensities (Beta or Gamma) from all radioactive elements where a source of AC power is not available. Address all inquiries to MINING WORLD.

CURVED JAW CRUSHER PLATES: Traylor curved crushing surfaces cut costs, improve crusher operation and outlast straight plates as much as 3 to 1. Further data obtainable by writing to MINING WORLD.

RUBBER TIRED DOZER: LeTourneau 19 mph. Tournadozers reduce deadhead cycle by 2.5 to 1, offers increased mobility, making for drastic economies in stripping operations. Information on 122 hp. D Tournadozer and 180 hp. C model available from MINING WORLD.

REVERSE FEED STOPERS: New compact Thor drills ranging from compact Model 200 to heavy-weight 600 offer simplified design, air cushioning, extra bearing surfaces and other features to sharply reduce out-of-service repair time. For complete literature or on-job demonstrations, write to Independent Pneumatic Tool Co., Aurora, Illinois, or to MINING WORLD.

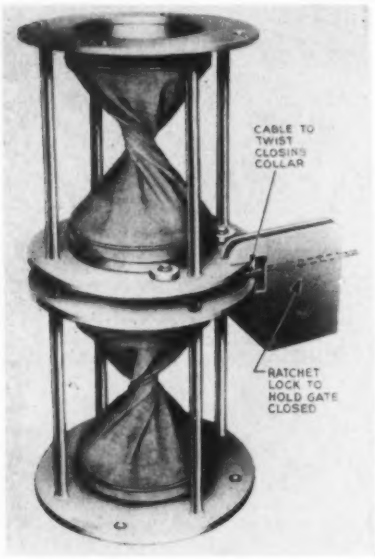


A RING FOR INSPIRATION COPPER

Weighing 19,000 pounds, this giant ring forging was made at the Torrance, California, plant of The National Supply Company, and shipped, with others of equal size and weight to Inspiration, Arizona, where it will be used as a Roll Shell for an Ore Crusher at the Inspiration Consolidated Copper Company. The ring was made by punching a hole in a solid slug of chromium nickel molybdenum steel, then forging it over a mandrel.

New "Twistite" Bin Valve Stops Ore-Bin Leakage

The "Twistite" Double-Closure Bin Valve consists of two rubber sleeves joined by a rotating steel collar. Dust and drip-tight closure is obtained by pulling on a cable wrapped around the rotating collar, sealing the opening with a twist in each of the rubber sleeves. The



valve is self-opening, the elasticity of the rubber sleeves causing them to resume their cylindrical shape immediately when tension on the cable is released. Since the flexible rubber sleeves can wrap themselves easily around lumps caught in the valve during closure, there is no danger of leakage due to variation in the size of material particles.

The standard 6-inch valve weighs 35 pounds with the ratchet cable-lock mounted on the valve frame. It will handle lump sizes up to 2½ inches and requires a 30-pound cable pull for closure. Other valve sizes are available on request.

Write to Stephens-Adamson Manufacturing Company at Aurora, Illinois; Los Angeles, California, or Belleville, Ontario, Canada, for sheet 254-A covering the "Twistite" Double-Closure Bin Valve. Copies can also be obtained from MINING WORLD.

Pullman-Standard Acquires Isaacson Tractor Line

Arrangements have just been completed by Pullman-Standard Car Manufacturing Company to enter the tractor allied equipment field.

On December 29, 1950, Pullman-Standard acquired the entire tractor allied equipment business of Isaacson Iron Works at a cash price to be finally determined later on in accordance with the recently executed closing agreement.

While the Isaacson tractor allied equipment business is not large in relation to Pullman-Standard's present volume of railway car business, its acquisition is considered to be an attractive opportunity to enter a new field where growth potentialities are clearly apparent and for which Pullman-Standard's facilities and resources are well adapted.

Tractor allied equipment embraces various accessory products, such as bulldozers, scrapers, rippers, hydraulic power units, hauling winches, and other equipment utilized with crawler-type tractors, primarily in the earth-moving field.

The Isaacson products, now being manufactured at plants in Seattle, Washington, and Rockford, Illinois, are sold in competition with tractor allied equipment of other makes throughout the United States by the same distributors who handle the marketing of International Harvester crawler-type tractors, with which Isaacson allied equipment is used. Foreign sales of such Isaacson products are handled through International Harvester Export Company.

New Hardinge Book On Sand Filter-Clarifier

A four-page bulletin, No. 30-B, has just been published by the Hardinge Company, Inc., 240 Arch Street, York, Pa., covering its line of Sand Filter-Clarifiers.

Quite different from the Hardinge Automatic Backwash Sand Filter, the Hardinge Filter-Clarifier is not a backwash type filter, but uses, instead, a spiral scraper that takes a cut off the sand bed when the filter rate decreases.

It is used in processes where a crystal-clear filtrate is desired. Numerous installations have been made for filtering gold solutions in cyanide mills, sodium chloride solutions in chlorine producing plants and other solutions in chemical plants.

Overhead Loader Attaches To International Tractor

The Lodover, a new 1-yd. combination overhead and front-end shovel for International Harvester tractors, is fully described in a new eight-page illustrated catalog just published by Service Supply Corporation, Philadelphia, manufacturers of the Lodover. In overhead loading, the loader picks up much in front of the tractor and rocks it overhead to load a truck placed behind the tractor. According to one catalog, the Lodover substantially increases loading production, because turns are eliminated. On many jobs, Lodover overhead loading steps up output as much as 50 percent. Elimination of turns, as many as 1900 per eight-hour shift, also substantially lengthens tractor life.

The Lodover is approved for International Harvester tractors, and is sold through International Harvester Industrial Power dealers.

For copies of LO-200-MW, the new Lodover catalog, write to MINING WORLD.

Electrifugal Pump Is Redesigned Motor Pump

A redesigned close-coupled Electrifugal pump and motor with internal and external design changes to provide improved operating characteristics and greater ease in maintenance has been announced by Allis-Chalmers Manufacturing Company.

The improved unit has new sealed motor bearings; a unit-cast frame which provides perfect and permanent alignment; double seal on front motor bearing which keeps liquid out of the bearing under normal operating conditions, and a large opening in the frame between the pump and motor to make packing maintenance quick and easy. Its all cast iron construction resists corrosive atmospheres. Its appearance is sleek and streamlined.

The pump is available with removable casing in some sizes and with removable cover plate in others. It can be had in ratings from 10 to 500 gallons per minute at heads to 220 feet.

Write MINING WORLD, 121 Second Street, San Francisco 5, California, for Bulletin 52B614OB.

Improved Lifting Magnet Now Available From Dings

The Dings Magnetic Separator Company announces that an Improved Lifting Magnet has been added to its line of magnetic equipment. The magnet can be used on overhead or crawler cranes to hoist, load, transport or otherwise handle all types of magnetic materials.

The manufacturer states that this magnet has the following improvements over

earlier models: lighter weight, welded construction replaces bolted construction, and insulating compound dissipates heat more rapidly and provides more protection against short-circuits between individual coil wires, four-point chain suspension instead of three, protector guards for the cable, and a balanced magnetic circuit that eliminates flux "bottle-necks" and thereby gives the magnet greater lifting ability. The lifting strength of each magnet is tested and certified before it leaves the factory.

This improved magnet is now available in five sizes: 29 inches diameter, 39 inches diameter, 45 inches diameter, 55 inches diameter, and 65 inches diameter. Write to MINING WORLD, 121 Second Street, San Francisco 5, California, for your copy of catalog B-1401-A.

PERSONALS

Continued from page 22

specialize in the beneficiation of the nonmetallic minerals. His address is Bull Mountain Road, Asheville, N.C.

Lewis A. Parsons, assistant consulting engineer for the Calaveras Cement Company, has been elected 1951 president of The Engineers Club of San Francisco, California.

Waldemar F. Dietrich, consulting engineer of Sacramento, California, has been named chief of the Rare and Precious Minerals Branch of the Minerals Division, U. S. Bureau of Mines.

Grover Holt of the Cleveland-Cliffs Iron Company has been elected chairman of the Minnesota section, A.I.M.E. Vice chairmen are *Hugh Leach*, *W. M. Matheson, Jr.*, and *E. P. Pfleider*. Secretary-treasurer is *Donald M. Davidson*.

Dr. Helmut de Terra has been named deputy director of the General Pumice Corporation of Santa Fe, New Mexico. German-born, he has been a geology professor at Yale, has been associated with the Carnegie Institute, and during World War II was mining consultant to the Mexican government and private U. S. interests.

John A. Garcia will be reappointed state mining inspector for New Mexico by Governor Mechem, according to reports. The appointment is for four years.

OBITUARIES

Paul C. Keefe, 66, metallurgist at the Phelps Dodge Corporation's smelter at Clarkdale, Arizona, died January 25. Keefe was a veteran legislator, having served five times as president of the Arizona Senate and twice as speaker of the House. He was a graduate of Yale University, Class of 1907, and went to Arizona as a mining engineer that year.

Edgard Rickard, 76, internationally known mining engineer and long associate of Pesident Herbert Hoover, died January 21 at Stanford Hospital, San Francisco, California. He had been associated with mining companies in the U. S., Mexico and Alaska, was a member of the A.I.M.E. and administrator on several wartime and postwar organizations.

Walter Geist, 56, president of the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, died January 28, 1951. He had joined Allis-Chalmers in 1909 as an errand boy at 10c an hour, was assistant manager in 1928, and became president in 1942. He was a member of many associations, had had several honorary awards given him, and was a director of about 18 firms and organizations when he died.

C. Quinby Schlereth, consulting mining engineer of Denver, Colorado, died November 11 at Denver. Among firms for which he had done consulting work were the Bagdad Copper Corporation in Arizona and the Molybdenum Corporation of America in Colorado.

Arthur Crandell Green, vice president of Goodman Manufacturing Company, Chicago, Illinois, died October 31.

Walter H. Wilson, 60, of North Hollywood, California, died in an automobile accident near Indio, California, October 17. He had been active in a number of mining ventures in Arizona, Mexico, Ecuador, and Brazil.

Dr. Claude Ervin Needham, 56, chief of the Mineral Statistics Branch of the U. S. Bureau of Mines Regional Office at Amarillo, Texas, died October 15 at Amarillo. He was a member of the A.I.M.E., American Association for Advancement of Science, Arizona Small Mine Operators Association, New Mexico Miners and Prospectors Association, and other organizations.

Humphrey Wallingford Chadbourne, 66 died at New York on October 26. A native of Houghton, Michigan, he had been connected with mining operations in the United States, Canada, Mexico, and South America. He retired several years ago as president of International Mining Corporation.

Thomas Joseph Caulfield, 67, retired master mechanic of the Kennecott Copper Corporation, Salt Lake City, Utah, died November 2 at Salt Lake City.

Robert A. Currie, 62, export manager for The Jeffrey Manufacturing Company, died December 8, at Columbus, Ohio. He had been with the company for 43 years and was one of the organizers of the Export-Import Club of the Columbus Chamber of Commerce.

Archibald Campbell Milner, 73, died December 8, at Salt Lake City, Utah. He was president of Milner Corporation, which helped develop the Iron County iron deposits, and was vice president of Pioche Mines Company at Pioche, Nevada.

Armour L. Stanley, district manager for the Harnischfeger Corporation, was killed in December at the Auburn mine, Virginia, Minnesota, when a bank of overburden gave way while he was inspecting a new Harnischfeger power shovel that had just been installed.

precipitates—CENTRAL and EASTERN

National Steel Buys 15% Of Reserve Mining Stock

The National Steel Corporation has acquired a 15 percent interest in the Reserve Mining Company, according to an announcement by Ernest T. Weir, chairman. The remaining interest in the company is owned by Armco Steel Corporation and Republic Steel Corporation.

Reserve controls iron ore deposits at the eastern end of the Mesabi Range in Minnesota estimated to contain 1,500,000,000 tons of taconite which should yield 500,000,000 tons of 60 percent ore. The company is planning installation of equipment in existing buildings on the property to produce 300,000 tons of iron ore annually in pelletized form.

A recent announcement regarding the $7,000,000 taconite plant to be installed at Babbitt said that the company had obtained permission from the county to use the water of Birch Lake in the plant, returning the water after tailings have settled out.

The *Copper Range Mining Company*, at the request of Dr. James Boyd, deputy administrator of the *U. S. Bureau of Mines*, has submitted a preliminary development plan for the re-opening of its White Pine copper mine near Bergland, Michigan. According to reports, the Defense Minerals Administration already has assured the company of a loan of $100,000,000 for development of the property in order to produce an ultimate 75,000,000 pounds of copper per year.

A search for what is thought to be a uranium-bearing cave in Barry County, Missouri, a few miles from Seligman, is being made by A. A. Michaels of Webster Groves. He is using electrical resistivity equipment and has found a cave which may be the one lost many years ago after several men discovered radium in it.

The *Lucky Dog* zinc mine and a nearby concentrating plant at St. Joe, Arkansas, were re-opened on January 3. The mine once was a large producer of zinc. Both mine and mill are being supervised by Polk Medley of Harriet.

Chairman E. G. Grace of the *Bethlehem Steel Corporation*, in the course of an announcement concerning plans for expansion of steel capacity, said, "Within a year, in association with *Pickands Mather & Company* and the *Youngstown Sheet & Tube Company*, we hope to have sufficient knowledge and experience with taconite to warrant the building of a plant at Aurora, Minnesota, for the production of usable ore from deposits, which should produce about 2,500,000 tons annually." He also said that Bethlehem has authorized the construction of two new vessels for Great Lakes iron ore traffic, 626 feet in length and 70 feet in width. The two boats are expected to be able to transport a total of about 1,400,000 net tons of iron ore and limestone annually and may be ready for service during the 1952 season.

The *Oliver Iron Mining Company's* experimental shipment of 135 cars of ore to eastern furnaces was sufficiently successful so that all-rail shipments to the eastern plants will continue throughout the winter and will be the first full-scale, all-winter ore movement in the Lake Superior district's history. That shipments may reach as much as 400 cars per day is expected. The ore is treated with calcium chloride as it is loaded at the mines and the steel plants have installed steaming facilities similar to those used at Duluth and Superior ore docks during freezing weather of the late fall. The ore will come from the *Spruce* and *Godfrey* underground mines and the *Canton*, *Sherman* and *Mountain Iron* pits.

The *Republic Steel Company* shipped a total of 1,868,242 tons of iron ore in 1950. The ore came from three mines on three ranges: the *Susquehanna* on the Mesabi was the largest producer, with 883,651 tons; the *Penokee* on the Gogebic had 566,599 tons, and the *Tobin* on the Menominee range shipped 406,993 tons. At the Susquehanna at Hibbing, winter stripping operations are being carried on which will enlarge the pit for the 1951 ore shipping season.

The *M. A. Hanna Company* shipped a total of 10,043,926 tons of iron ore in 1950 from its Minnesota mines, with the Mesabi range contributing 8,104,728 tons, the Cuyuna, 1,617,527 tons; and the *Spring Valley* mine (southern Minnesota), 321,671 tons—all rail. The largest shipments were from the South Agnew, 817,349 tons, a notable accomplishment considering its brief existence as a difficult openpit mine. The next largest shipments were from the *Bray*, 742,493 tons, and the *Buckeye*, 681,740 tons. The company's Iron River district, Michigan, mines produced nearly 2,000,000 tons during 1950, and active stockpiling of ore in preparation for the 1951 season is under way. Dewatering continues at the *Tully* mine and winter repair work at the *Richmond* pit at Palmer.

The *Charleson Iron Mining Company* of Hibbing, Minnesota, shipped 191,139 tons from its lean ore concentrator at the *Missabe Mountain* mine stockpile, Virginia. The plant was developed by Charles H. Remer, vice president and general superintendent of the company, and has been very successful in treating this difficult ore.

The *Cleveland Cliffs Iron Company* shipped a total of 7,882,919 tons of ore in 1950. Of that amount 3,891,887 tons came from the Marquette range of Michigan with the *Mather* mine the leading shipper

THICKENER AT FLORIDA PHOSPHATE MINE HAS 10-ACRE POOL

This aerial view of The American Cyanamid Company's Sydney mine property in Florida shows a Dorr Thickener installation which went into operation last year. Designed to clarify 15,000 gpm. of phosphate rock tailing water carrying two percent solids, it consists of a 300-foot-diameter special SSG Thickener mechanism incorporating a flocculating feedwell and picket arms installed in a 750-foot-diameter earthen basin with a sloping bottom. Preliminary thickening to a concentration of about six percent solids takes place in the outer, unswept portion of the basin. Final thickening to 12-15 percent solids is effected by the mechanism in the central area. Overflow is reused in the washing plant; underflow is impounded.

at 98,584 tons, establishing an individual record as well as a world record for any single shaft iron ore mine. The *Spruce-Virgil* mine on the Menominee range produced 257,838 tons and the Mesabi range furnished 3,733,194 tons, of which the *Holman-Cliffs* at Taconite contributed the largest tonnage, 872,666 tons, while the *Canisteo* at Coleraine was second with 678,922 tons. There were eight shipping properties from the Marquette range, one from the Menominee and nine from the Mesabi range.

The *Inter-State Iron Company* shipped a total of 3,510,053 tons of ore from its Minnesota mines in 1950. For the first time, the *Hill-Annex* mine at Calumet dropped from first place in the company's list; from it were shipped 751,682 tons, an amount exceeded by the *Longyear* with 984,586 tons and the *Columbia* with 789,676 tons. The *Grant* provided 363,183 tons. From the *South Longyear* 336,015 tons was mined and shipped by the *M. A. Hanna Company*, operating agent. A full program has been outlined for all of Inter-State's mines during the winter months. The company is stripping at its *Schley* mine at Gilbert and expects to ship ore from the pit in 1951. (The Schley is an old underground mine which was opened up by the *Republic Steel Corporation* more than 40 years ago.) Stripping is also being done at the Longyear mine and the Hill-Annex. At the latter two new pockets and screening plants are being built. The product of one of these plants will be carried to the main pit pocket by cross-conveyor.

Diamond drilling exploration work east of Crystal Falls, Michigan, has been extensive and some new orebodies are reported to have been discovered. *Inland Steel Company* has a lease on the *Lepiec* property on M-69 and *Republic Steel Corporation* is contemplating opening up a new mine in Western location, near the abandoned Crystal Falls airport. Meanwhile Republic has put operations at its *Tobin* mine at Crystal Falls on a six day per week schedule instead of the previous five days, and negotiations are pending with the M. A. Hanna Company to permit mining of ore from Hanna's *Monongahela* mine, which adjoins the Tobin on the west. The Monongahela was operated by Hanna about 25 years ago, work being then confined to two levels. Although no actual mining had begun at the Monongahela in the beginning of February, hoisting engineers began work at the mine in January.

Zontelli Brothers of Ironton have begun work on the *Gorman* property in Morrison County, Minnesota, near Randall, a new area for mining. Ore may be shipped from the property in 1951.

The *W. S. Moore Company* begins soon to open up its *Jordan Reserve* mine at Buhl, Minnesota. The mine has an estimated tonnage reserve of 256,823 tons. No shipments have yet been made from the mine.

The *M. A. Hanna Company* is building a new screening plant and a new service garage at the *Perry* mine. Stripping is being carried on at the *Argonne*, *Harrison* and *Halobs* mines in the Nashwauk area. Operators at the *Morton* mine, west of Hibbing, moved nearly 400,000 cubic yards of surface in December and will continue through the winter, using two 6½ cubic yard shovels. The *Section 6* mine on the Cuyuna range, and the *Buckeye* on the western Mesabi range, are also being stripped.

precipitates—NORTHWEST

A5&R Will Install New Hoist at Vulcan Mine

American Smelting and Refining Company will install a new hoist, being moved in from Nevada, at the Vulcan Silver-Lead Corporation property it runs at Wallace, Idaho. Housing facilities are being constructed now. A new headframe also may be built at the Vulcan over the old Galena frame, although the company says such a replacement may not be necessary in the end. While installing the new hoist, production will cease for about three months.

The company's diamond drilling program is continuing on the 3000 level. Holes have been driven northeast and northwest from the south crosscut.

Silica to be Mined and Milled in Stevens Co.

Plans to mine a hill of almost pure silica sand and construct a $100,000 treatment plant at Springdale in Stevens County, Washington, were announced recently by Frank Eichelberger, internationally known mining engineer, and J. W. Melrose, formerly geologist for the Chicago, Milwaukee and St. Paul railroad. Work is to begin as soon as weather permits.

They said the deposit they have leased is the only one of its kind so far discovered in the Pacific Northwest and was found five years ago by the Washington State Division of Mines and Geology. Washington State College technicians are reported to have done much research on the physical and chemical properties of the sand, reduction methods and possible uses. According to them, the sand could be treated at low cost and could be used in making the finest kinds of glass. At present, all of the approximately 150,000 tons of silica sand used annually by industries in the Northwest is imported, chiefly from California, Illinois, and Wisconsin.

Eichelberger reports that the deposit is unique because of its purity and because the sandstone is loosely cemented. A simple crushing operation is considered sufficient to free the grains of quartz. The deposit, which covers approximately 54 acres, is said to be 1800 feet long, 1200 feet wide, and 140 feet deep. The State Division of Mines and Geology estimated the tonnage above surrounding ground level at 6,500,000. This would be sufficient for more than 50 years of production at the planned initial rate of 250 tons per day. As many as 30 men will be required to carry on the complete operation.

Mullan Metals, Inc., has been incorporated by John Posnick, John Sekulic, and John Giachino to develop the *Big Four* mine west of Mullan, Idaho. The firm is capitalized for $350,000. The property was found in 1904 by John Giachino's father, consists of 12 unpatented claims on the north side of the Coeur d'Alene River's south fork, and adjoins the *Mineral Farm* mine and the Anderson ranch. Workings include a 500-foot tunnel and further development is scheduled soon.

In the Evolution district near Coeur d'Alene, Idaho, *Day Mines, Inc.*, and the *American Smelting and Refining Company* have reportedly bought two unpatented mining claims from *Coeur d'Alene Consolidated Silver-Lead Mines,*

KROMONA MINES WILL START MILLING COPPER ORE THIS SUMMER

Kromona Mines Corporation has purchased complete equipment for installation of a new 100-ton flotation mill to be built at its property, 19 miles by road northeast of Sultan, Washingon. The mill, designed by Robert J. Cole of Seattle, incorporates a flowsheet worked out by the Denver Equipment Company, which ran bulk tests on the copper ore. The 10 by 10 inch Denver crusher, 22-inch Symons cone, Denver 5 by 6 foot ball mill, six No. 18 Denver "Sub A" flotation cells, and other equipment are now at Sultan; they will be trucked to the millsite as soon as weather permits. A most interesting feature of the new mill, which will be completed this summer, is that all tailing and concentrate will be filtered so that no tailing water will contaminate Sultan River.

In the picture at right, President Joe F. Krom points to an outcrop across the valley that is a continuation of the vein in Kromona mine. Visitors and miners are sitting near a temporary shack at the 3500-foot (elevation) level. The mill will be built on the 2500-foot level, the same elevation as the South Fork of the Sultan River. In the picture at left a party of visitors studies the granite formation on the footwall side of the vein. Foreman Jim Stonehouse, Sr. (left) stands at the portal of a prospect drift in the upper left-hand corner is driven on the intersection of a cross-vein system.

Inc. The claims are known as the *Hawk* and *O. K.* and were owned by Bill Fahle. In the Hunter mining district Day Mines is said to have bought the *Fannie Gremm* and *Twenty-two Short Fraction* claims from the *Fannie Gremm Mining Company's* stockholders, of which Irene Vermillion is president. The claims are about a mile north of Mullan and are bordered by holdings of the *Federal Mining & Smelting Company*, the *Independence Lead Mines Company*, and the *Premier Star Mining Company*. Further reports of Day activities say the company is negotiating for the *Richmond* mine near Adair, a copper producer.

The *Monsanto Chemical Company* is said to be discussing with the *Atomic Energy Commission* a proposal that the company build a nuclear reactor to produce plutonium, possibly at Pocatello, Idaho. This location has been suggested because Monsanto has leases on phosphate property in southern Idaho and could use the electric-power by-product of the reactor to refine elemental phosphorus. Both the *Dow Chemical Company* and the *Detroit Edison Company* also are discussing reactor building with the AEC at undisclosed sites.

Preparations are under way for the installation of a new 8 by 48-foot ball mill at *Federal Mining and Smelting Company's Page* concentrator west of Kellogg, Idaho. The present facilities consist of one 8 by 48 and another 8 by 36 unit. Improved metal recovery and separation is expected when installation of the new mill is completed. At Mullan, Idaho, the company reports a new 5000-foot level has been established in the *Morning* mine at a point 900 feet below sea level. The mine's surface or outcrop is at 5680 feet above sea level.

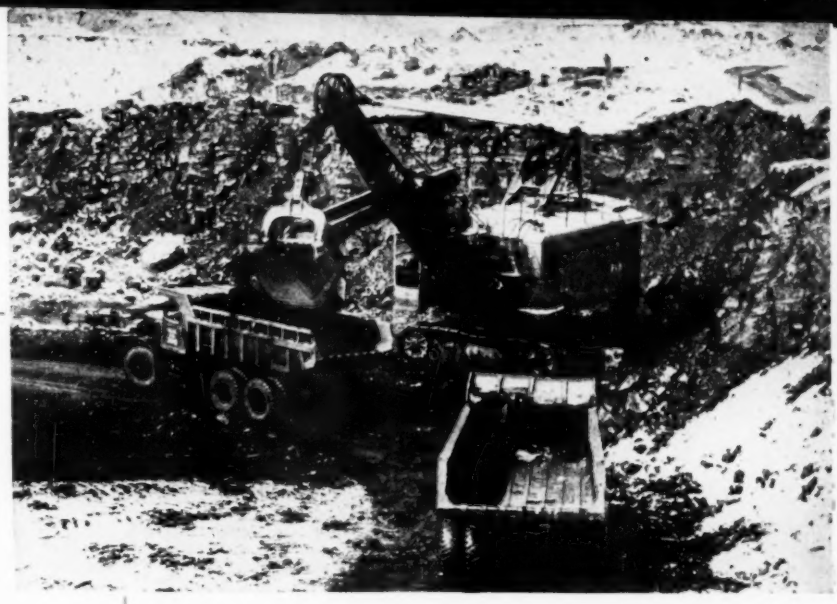
Lucky Friday Silver-Lead Mining Company, Nevada-Stewart Mining Company, Coeur d'Alene Mines Corporation and *General Mines Corporation* have located further ore showings in their mines during the past few weeks. Lucky Friday is developing a silver-lead-copper vein on the 1800, lowest, level; an east drift has followed this vein for 55 feet. Nevada-Stewart cut two lead-zinc veins while diamond drilling on the 7000-foot level. One vein was found 80 feet beyond the face of the tunnel driven from *Highland-Surprise* ground and was said to be 11 feet wide at the point intersected. The second vein, cut 90 feet beyond the first, was said to be 15 feet wide. Coeur d'Alene Mines struck silver ore on the 2800 level during diamond drilling exploration. The showing was within the vertical boundaries of the *American Silver Mining Company* property, which Coeur d'Alene Mines is developing on a 50-50 basis. Reports said a 400-foot crosscut would be driven to the strike location. General Mines found copper-gold-silver ore in a raise in *Big Eight* mine at a point 3000 feet from the tunnel portal. The company is planning to drive the raise to the surface, a distance of about 700 feet, and figures that three more veins may be found in the process. Milling facilities may be installed at this mine to handle the company's growing stockpile of ore.

Mascot Mines, Inc., which is developing the *Little Pittsburg* mine in the Pine Creek area, Idaho, has sunk its main working shaft 150 feet below the No. 8, main, level and has cut a station at that point. The mine was formerly run by the *Denver Development Company* and Ivan Norgaard, who is a co-partner in the latter company, also a director of Mascot and in charge of all underground work. Mascot repaired the mill on the property last year and since January of this year has milled 1200 tons, recovering a reported 125 tons of zinc concentrates and 40 tons of lead concentrates. Milling is under the management of Dunham Bell.

MONTANA

Signal Mining Company is said to have ceased developing its Bannack, Montana, gold mine for the winter and is engaged in surveying its Pine Creek lead-zinc properties in Idaho in hopes of getting one of these prospects into production before long.

Golden Anchor Mining and Milling Company currently is developing its property consisting of 36 mining claims in the Treasure Mountain district near Elliston, Montana. Last summer an access road was built, mine buildings constructed, and the tunnel portal dozed to bedrock. Two orebodies, the *Big Dick* or *Evening Star*, and the *Black Jack* were mined in early days and were producers of high-grade gold near the surface. In 1946 lessees were shipping considerable ore from the properties. Present plans call for new machinery and a new working tunnel to the blanket-type vein in the Big Dick also to be used to tap Black Jack ore.



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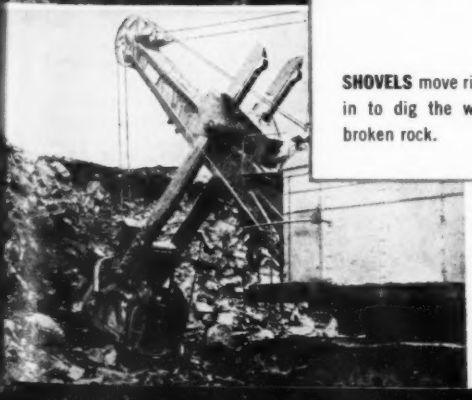

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Fifty-four thousand dollars in [shares] for exploration and development [in the] Basin, Montana, region have been [offered] by the *Metals Milling Company*, Inc., Route 9, Tacoma, Washington. The [company] wishes also to finance acquisition of equipment for a custom mill at the site to treat lead-zinc ores. The mill would have a 100-ton daily capacity and would be in operation by early summer, according to reports. Officers and directors of the company are Benjamin H. Linn, Petra Linn, Roy M. Brennan, and Dudley Gunston of Tacoma; William M. Derig of Seattle; and Charles Kenaston of Olympia.

In 1950 Montana's mineral production was valued at $110,462,000 compared to $108,334,000 in 1949, according to Una M. Sahinen of the State Bureau of Mines and Geology, who compiled preliminary figures from tonnages mined. Zinc production went up from 108,000,000 to 128,000,000 pounds. The estimated value of copper during 1950 was $22,350,000 ($46,000 less than in 1949); and of manganese ore, $6,075,000, compared to $5,068,000 in 1949.

Several mining companies recently were incorporated in Montana. These include the *Giant Milling & Development Company* of Helena, capitalized at $50,000 and headed by B. J. Pugh,, L. E. Dick, and M. M. Martin; the *Interstate Manufacturing Company*, capitalized at $500,000 and headed by C. A. and M. G. Lester and E. F. Bunker of Bozeman (this company expects to mine asbestos and manufacture asbestos products near Bozeman); *Belmont Mountain Gold Mining Company*, capitalized at $50,000 and headed by I. Kay Hall, Andrew L. Anderson and C. K. Jardine of Helena; and *Geyser Gypsum Company* of Geyser, capitalized at $150,000 and headed by Ewing E. Storm, James L. McKay and Ernest C. Martin.

WASHINGTON

Negotiations with *Chromium Mining and Smelting Company* for the purpose of running the Mead, Washington, magnesium plant at full capacity have been proposed by the Munitions Board, according to reports. Chromium's subsidiary, *Pacific Northwest Alloys*, is now operating half of the plant and doubled output could be achieved by reactivating another potline. Chromium's lease on the property calls for surrender of the plant to the government on 120 days notice if the government wishes. During the war *Electro Metallurgical Company*, a subsidiary of the *Union Carbon and Carbide Corporation*, operated the plant but decided not to continue the operation in peace time. The Munitions Board says that either that company or Pacific Northwest Alloys is qualified, therefore, to run the Mead plant, but since the latter is already on the spot, there is little reason for a shift in operating companies now.

The Northwest Mining Association has gone on record as favoring legislation proposed at the state legislature of Washington, which would modify existing rules covering the regulation of mining securities. Basically, the bill provides for more protection for the investor, without basically curtailing the legitimate activities of any mining company.

precipitates—SOUTHWEST

Navajos to be Allowed to Reassign Mining Permits

In an effort to spur development of uranium deposits on the Navajo Indian Reservation in the Southwest, the Indian Bureau has ruled that members of the tribe may reassign their mining permits. The Navajo Tribal Council had asked that the former restriction (under which Navajos who were granted mining permits on the reservation in Arizona, New Mexico and Utah were forbidden to reassign them) be relaxed since the individual Indians lacked the technical knowledge and money to develop the uranium discoveries.

According to Rex Lee, assistant Indian commissioner, the regulation applies only to existing permits held by individual Indians.

Lead-Fluorspar Operation Starting in Yuma County

With all new DECO equipment installed, the Abt mill has been revamped to treat lead ore from the old Castle Dome mine in Yuma County, Arizona. The mill is at McPhaul Bridge, near Blaisdell on Highway 95, Yuma County, and owners and operators of the property and mill are Kenneth J. Hines, 2047 Granada Avenue, San Diego 4, California, and associates.

Flotation equipment is being assembled to produce a highgrade fluorspar concentrate from old lead tailing. This section of the plant is expected to be ready to operate in about 90 days, at which time the men will purchase any custom ore that the mill can treat successfully. A small 10-ton lead smelter may be installed later either at the mine or mill. Hines says that portions of the Castle Dome claims (also known as the DeLuce properties) probably will be leased on a straight royalty basis to operators who will mine the ore to the sulphide zone.

As old-time operators only sunk and drifted on lead ore, many tons of lump, acid grade fluorspar remain, some assaying 99 percent CaF_2, and there are also several thousand tons assaying from 15 to 60 percent CaF_2. A loader and picking belt will be installed, and the company intends to hire old and disabled men and pay cash for each ton they hand-cob. Living and eating quarters will be built for them.

F. A. Sitton, Inc., is rapidly expanding production of uranium-vanadium ore from its holdings in the Lukachukau Mountains of northeastern Arizona. Production to date has come from four surface workings but underground operations will be started in the near future. All ore mined so far has been shipped to the *Atomic Energy Commission's* mill at Monticello, Utah. The ore is hauled off the mountains in six-wheel-drive trucks and reloaded at Cove, Arizona, into highway-type, 20-ton trucks for shipping to Monticello by way of Shiprock, New Mexico, and Cortez, Colorado. A special training program is under way to teach the Navajos how to mine. The company has moved its headquarters to Cortez, Colorado, and R. O. Dulaney is in charge of uranium mining operations, assisted by G. R. Kennedy.

J. C. KINNEAR, vice president of Kennecott Copper Corporation, McGill, Nevada, has been elected president of the Nevada Mine Operator's Association for the 24th consecutive time. Vice president elected was R. A. Hardy, consulting engineer for Getchell Mines; second vice president elected was Percy G. Dobson, general manager of Summit King Mines; and secretary-treasurer Henry M. Rives. On the executive committee for 1951 are E. A. Julian, vice president of Goldfield Consolidated Mines Company; Charles H. Segerstrom, Jr., president of Nevada-Massachusetts Company, John C. Kinnear, Jr., general manager of Kennecott Copper; George W. Mitchell, general manager of Eureka Corporation, Ltd.; and W. S. Larsh, consulting engineer of Carson City.

Affiliated Photo-Conway

The initial diamond drilling contract in Arizona of the *Minerals Engineering Company* of Grand Junction, Colorado, has been successfully completed for the *Atomic Energy Commission*. The contract was for 50,000 feet of surface holes at an average depth of 196 feet. According to reports the drilling resulted in the discovery of a number of orebodies which did not crop out. The work was carried out in the Lukachukau Mountains in the Navajo Indian Reservation.

The *Merlo Mica Mining Company, Ltd.*, is operating a scrap mica mill in the Maynard Mining district near Kingman, Arizona, and readying shipment of about 300 tons monthly from its openpit operations. Frank Merlo, Box 1111, Kingman, is general partner; B. L. Gamel is superintendent; Horace A. Lackey is manager, and a crew of seven men is employed. According to reports the property also contains several beryllium prospects which are being investigated to determine extent and value.

Phelps Dodge Corporation, Douglas Arizona, has offered to spend $1,500,000 to concrete-line canals of the Salt River Valley Water Users Association. In return, Phelps Dodge would receive one-half the water saved thereby over a 15-year period. Estimates indicate that the water thus obtained would cost the mining company $20 per acre foot per year, not counting the expense of pumping it out of Black River over a divide into Eagle Creek, and again pumping it out of Eagle Creek to the Morenci Branch of Phelps Dodge. The proposal would involve 15 miles of canal with the seepage saved estimated at 10,000 acre feet per year. The copper company would be required to compensate the Water Users for power loss since water taken out of the Black River would not reach the hydroelectric power plants. The proposal will be submitted to shareholders of the Salt River Valley Water Users Association for approval.

Arizona Copper Mines, Inc., has announced plans for mining low-grade copper ores in the Catalina Mountains, about 20 miles north of Tucson, Arizona. Articles of incorporation for the mining company have been filed with the Arizona Corporation Commission by J. E. Moewinckle of San Antonio, Texas, president. Properties controlled by the new corporation are located in the Old Hat district and were formerly known as the *Control* mines, the *Daily Arizona Mining Company*, the *Stratton Mining Company*, and the *Hartman* claims.

Normal operations have been resumed at the *San Xavier* mine of the *Eagle-Picher Mining and Smelting Company*, near Tucson, Arizona, with the ending of a 58-day strike.

The *Empire* claim of the *Duquesne Mining Company* is being leased by O. De La Ossa, c/o Washington Camp, Patagonia, Arizona. He is sinking a shaft in ore and shipping about 65 tons of zinc, lead, copper ore monthly. Three men are employed.

The *Success Mining Company* is said to be ready to start operation of its new mill at the *Telluride Chief* mine in the Wallapai Range near Kingman, Arizona. Extensive development work has opened up a considerable tonnage of tungsten ore, according to reports. The Success company acquired the Telluride Chief from former owners last fall.

Mining operations have been started on a group of 22 tungsten claims in the Dragoon Mountains, north of Dragoon, Arizona, by Ray Fernstrom, 648 West Oro Street, Tucson, Arizona. The ore is hauled to the *Fernstrom* mill in Tucson, where it is prepared for carload shipment to eastern steel mills.

Work is being started at the *Unida* copper-gold mine by *United Mine Operators, Inc.*, C. L. Maguire, president, Box 836, Wickenburg, Arizona. Ernest Sturrock, superintendent, has a crew of eight men grading out for compressors, putting up a powder magazine, and doing miscellaneous preliminary work. Lynn Hersey, Box 1115, Miami, will direct the development program as consulting engineer.

Ray Dye and Jack Bathrick, Box 1069, Kingman, Arizona, are making shipments of copper, zinc, lead ore from the *Copper World* mine, near Yucca. Production is averaging about 400 tons monthly from

cut and fill stopes. A raise is being driven for better ventilation and to provide a second exit.

A discovery of uranium mineralization has been confirmed, and the mineral tentatively identified as autunite, on Murphy Butte, Section 9, T9N, R13W, MDB&M, six miles west of Rosamund, California. This location is directly west of *Burton Brothers' Tropico* mine and formerly was worked by the *Walabu Mining Company*. Walter F. Buaas, president of *Buaas Drilling Corporation* and owner of the discovery property, says, "The discovery of uranium on the old Walabu gold property is significant, even though the mineral we have found so far cannot be classified as commercial ore."

At Laws, California, the *Huntley Industrial Minerals, Inc.*, has installed a second 5-roll Raymond mill to grind nonmetallic minerals, such as clay, pyrophyllite, asbestos and barite-mica-feldspar for industrial uses and has begun producing asbestos from a deposit near Tin Mountain. In the near future the company intends to install two Raymond impact mills.

Purchase of tungsten ores, middlings, and low grade tungsten concentrates is planned by *U. S. Vanadium Co.*, a division of *Union Carbide and Carbon Corporation*, according to H. L. McKinley, general superintendent at the company's Pine Creek mine and mill near Bishop, California. In view of the changed economic and strategic position of tungsten, materials rejected from tungsten processing plants, such as sludge, slime, and magnetic-separator rejects are often suitable for treatment and conversion into high grade concentrates and consequently are also desired. The company's mine and mill at Pine Creek currently are operating at peak capacity to meet the nation's expanded tungsten needs; plans to increase mill capacity are under way. The company expects also to begin treating ore mined from its properties at Winnemucca, Nevada, at Pine Creek.

Continued work by the U. S. Geological Survey at the rare earth strike 35 miles east of Baker, California, has resulted in the discovery of further deposits. The original discoveries were made on the *Birthday* claims. Two further deposits, one 3,000 and one 4,000 feet southeast of the Birthday claims, show an average rare earth content of about 20 percent in samples tested, it is reported. A good deal of barite also is contained in the deposits. The new finds are reported to be on property owned by the *Sulphide Queen Mining Company*.

The *New Almaden* quicksilver mines at New Almaden, Santa Clara County, California, probably will not be reopened in spite of the high quicksilver price now prevailing. Unless there are more assurances than are now apparent that the price of quicksilver will remain at a profitable level, reopening is considered a hazardous venture.

Production of iron ore from the *Iron Age* mine by openpit methods is said to be planned. The mine is about 33 miles

east of Twentynine Palms, Califor[illegible] A road being built to Amboy, to fa[illegible]itate trucking, nearly completed. Fr[illegible] A Storey and Harlow Simpson of [illegible]anta Ana run the mine under lease.

The *Kittle* tungsten mine near B[illegible]hop, California, has been acquired b[illegible] the *Pinnacle Mining Company*. Ope[illegible]tions are said to have started and arrang[illegible]ents made to ship scheelite to the Be[illegible]ware concentrating plant just south of B[illegible]hop. Another tungsten operation said [illegible] be scheduled to begin in the spring i[illegible] that of the *Strawberry* mine near Yo[illegible]mite National Park. Development is now under way and a crushing unit has been installed in the mill.

The *Madrona Mining Company* is said to be mining high grade gold at its property near Volcanoville, El Dorado County, California. The mine is developed by a 200-foot adit along the south rim of Blue Channel and a crosscut, now advanced about 70 feet, is being driven toward the north rim of the channel. F. C. Bishop is president of the company and Otto C. Radley is managing engineer.

The 39th District Fair Association will have its annual program, May 18th, 19th and 20th, at Frogtown, a mile south of Angels Camp, Calaveras County, California, according to J. D. Whitney of Angels Camp. The mining section will include special entries of strategic minerals and the usual display of ores from all parts of the county and district.

Donald F. McGrew of Darwin, California, and William M. McKeever are in the process of forming the *U. S. Tintype Corporation* to work a deposit of cassiterite in Shepherds Canyon near Trona, San Bernardino County, California. McGrew hopes eventually to be producing 4,800 tons daily through openpit operations. To finance such a large undertaking he has applied to the Defense Minerals Administration for approximately $2,000,000.

A. L. Foss is continuing exploration of the *Surprise* mine near Death Valley, Inyo County, California, and is making occasional shipments of lead-silver ore to the Selby smelter. Foss resigned as state mine inspector in Southern California in 1948 to manage his mining properties.

NEVADA

H. W. Gould & Co., 1000 Mills Building, San Francisco, California, recently acquired the *Baxter* fluorspar mine, six miles west of Broken Hills in Mineral County, Nevada, for a reported price of $250,000. V. S. Baxter had been shipping ore from the property since 1928. The mine has been developed to a depth of 400 feet along a strike length of 2,000 feet on four levels. A large tonnage of fills and dumps is available for treatment; further tonnage will be mined at depth. The Gould company plans to erect a 250-ton Heavy Media Separation and flotation mill on the property. Bruce A. Gould is president.

Robert B. McPherson of San Francisco has taken a bond and option on the *Peterson* antimony property consisting of six claims, 60 miles north of Tonopah, Nevada. The claims, consisting of the

King Solomon, King Solomon Annex, Mountain View, Lorena, Corbett and *Monarch*, are owned by Magnus Peterson. McPherson has a small crew at work unwatering the main shaft and preparing the workings for production.

Three tungsten claims in Spanish Canyon near Austin, Nevada, have been leased from owner George Rong of Manhattan by the *Marson Enterprises, Inc.*, Beverly Hills, California. According to F. D. Shuck, engineer for the latter, road construction will soon be completed and a mill will be installed shortly thereafter. The company expects to do extensive development. Names of the claims are the *T-Bone, Pork Chop* and *Fried Chicken*.

The *Consolidated Coppermines Corporation's* openpit copper mine at Kimberly, Nevada, is being mined under contract by the *Isbell Construction Company* of Reno. Isbell's crew is working on a three-shift basis with three power shovels in operation and five carryall scrapers, Caterpillar drawn. The approximate daily tonnage of ore and waste moved is 30,000 tons. A. J. O'Connor is general manager of Consolidated and Frank Quilici is superintendent in charge of operations for Isbell.

Bill Hammond and J. P. Burgess of Tonopah, Nevada, have located two claims in the town of Goldfield and are planning to sink a deep shaft to reach an old underground lake bed believed to carry gold values. The claims are the *Lena Rose*, located just north of the courthouse, and the *Lena Rose No. 2*, southwest of the Goldfield Hotel.

According to Ralph W. Hayden, mill superintendent, the *Copper Canyon Mining Company* near Battle Mountain, Nevada, has ceased mining and milling of copper-lead-zinc ore at present and has a construction crew of 18 men at work rebuilding the crusher plant and framing shaft timbers. Retimbering of the shaft will begin shortly.

Lessees Harper and Kirk, who recently sunk a 40-foot shaft in a portion of the *Consolidated Virginia Mining Company* property on the Comstock Lode, have advised that a deposit of silver ore was found which may be an entirely new structure. Further investigations are being made. The mine is at Virginia City, Nevada.

Combined Metals Reduction Company is making progress on the construction of a Heavy Media Separation plant addition to its Caselton, Nevada, flotation mill. The company is increasing the capacity of the *Caselton* mine by the addition of hoisting and compressor equipment and is preparing to produce manganese concentrates for treatment at Henderson, Nevada, where the company leases part of the *Basic Magnesium Plant*. Combined Metals is increasing shipments of sized perlite from its Caselton plant. *Gibbons and Reed, Inc.*, Salt Lake City contracting firm, has taken a contract for mining and delivering coarsely crushed crude perlite from the *Hollinger* quarry to the Caselton preparation plant. Work is underway at the *Pan American* mine of the *Comet Coalition Group* to prepare the property for large scale production by early Fall.

Operation of the *Ely Valley* flotation mill at Pioche, Nevada, by the *Callahan Zinc and Lead Company* has begun again. Ore from the Ely Valley mine is being treated.

The *Red Hill Florence Mining Company* is said to be interested in the possible development of copper property in the Basalt District and may give up its lease on a section of *Deep Mines Operation's* property at Goldfield, Nevada.

About 100 feet of drifting in *Lime Mountain Consolidated Mines, Inc.'s* property near Mountain City, Nevada, has opened up a wide vein of lead-zinc-silver ore at a depth of 100 feet, according to Otto C. Radley, mining engineer of Auburn, California, who recently returned from a visit to the property. He said continued development was indicated.

The 500-foot adit being driven at *Hamilton Development Company's* property has been advanced 150 feet and should strike the ore zone in another 25 feet, according to company men. The mine is near Ely, Nevada, in the Hamilton mining district. Work on the adit is being done under contract by Angelo Reck of Ely. J. V. Saselli is resident engineer for Hamilton.

NEW MEXICO

The No. 4 shaft of the *International Minerals & Chemicals Corporation* at Carlsbad, New Mexico, was being grouted in February, and shaft-sinking is expected to begin this month. The firm's

STANDARD ENGINEER'S REPORT

DATA

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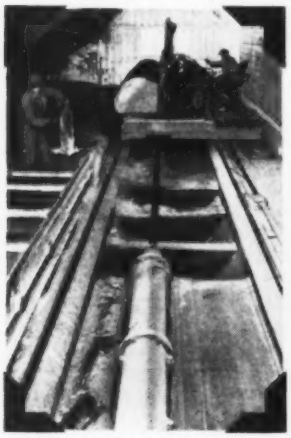

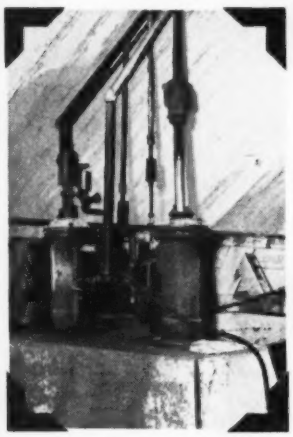

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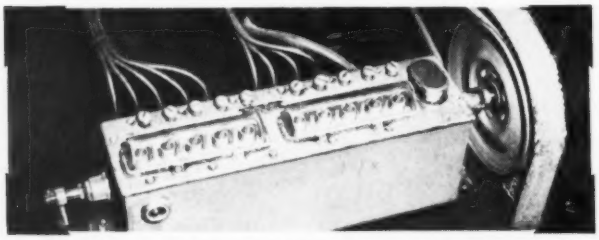

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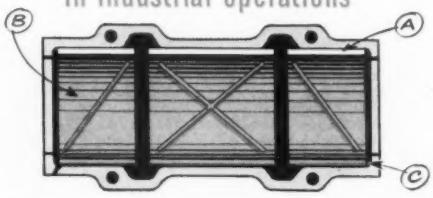

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No. 3 shaft was down over 570 feet by the end of January. The company expects to spend about $3,275,000 on new mining shafts and surface development at its potash plant during the next 18 months.

Around-the-clock, seven-day schedule went into effect in late 1950 at the *Kennecott Copper Corporation's Chino Mines Division* at Santa Rita and Hurley, New Mexico. The firm, working 2,000 men at the two sites, is stepping up waste stripping in the Santa Rita openpit and uncovering low grade deposits in the east and west ends of the pit. The report of this activity predicted also that Grant County might break its World War II peak production record when 1950 statistics are tabulated.

The *Santa Fe Pacific Railroad Company* has decided to extend its exploration program on the recently discovered uranium deposits on its property near Grants, New Mexico, according to R. G. Rydin, vice president. At the end of January, Rydin; Fred Gurley, president; Jesse Johnson, head of the *Atomic Energy Commission's* procurement division; J. B. Knaebel of the *Anaconda Copper Company*, and others, made a thorough inspection of the property. Gurley announced that the Santa Fe had set up headquarters at Baca, 20 miles from Grants, for its uranium exploration and testing work (which is being called "Operation Haystack"). A crusher and assay equipment have been installed at headquarters. According to Thomas Evans, chief mining engineer for the Santa Fe, preliminary testing is being extended to embrace Sections 13, 17 and 25 in addition to Section 19, where exploration currently is being done. Evans is not prepared to say when actual mining will commence. He indicated, however, that it will be an openpit operation.

An important new fluorspar discovery is believed to have been found by C. R. Buckelew of Hatch, about six miles northeast of Derry, in Sierra County, New Mexico. The find is on the site of the old *Loraine* mine, neglected for more than 20 years. First assays were said to be encouragingly high.

The *Socorro Corporation* has been formed in New Mexico to take over operations of the *Rock Products Company* at Socorro. John Emmons of Albuquerque heads the new company, with G. E. Tatman in charge of manganese mining and concentrating operations. According to reports a contract for manganese purchase by the Government has been signed at a price of $1.50 per long ton unit of manganese.

TEXAS

Dr. W. N. McAnulty of Alpine, Texas, head of the department of geology at Sul Ross State College, has confirmed the discovery of a commercial deposit of cinnabar, a source of mercury, just outside the northeastern boundary of Big Bend National Park. John Bennett, ranchman, operating north of the park, discovered the new deposits. More than 100 miners were employed in the production of mercury from extensive cinnabar deposits near Terlingua during and preceding World Wars I and II. Present mercury prices may reopen some of these mines.

precipitates—ROCKY MOUNTAIN

Salt Lake City to be Site of New Uranium Refinery

The Vitro Chemical Company has bought the Salt Lake Kalunite plant at Salt Lake City, Utah, from J. R. Simplot of Boise, Idaho, and has begun converting the plant into a uranium ore refinery. Vitro expects to buy and treat local uranium ores, and this fact, very possibly, will stimulate production in the Utah-Colorado-Montana-Nevada areas.

The plant had been operated during the last war by Kalunite, Inc., a subsidiary of Olin Industries, and produced alunite but was closed in 1946 by orders of the War Production Board. Later J. R. Simplot bought it to produce chemical fertilizers but had to close soon after because of a shortage of hydrous ammonia. The reconversion for uranium treatment will be complicated; the company is said to be planning a plant similar to the one at Monticello, Utah. Valuable data along these lines have been given by S. R. Zimmerly, chief, Metallurgical Division, U. S. Bureau of Mines' experiment station at Salt Lake.

Vitro Chemical is a newly created subsidiary of Vitro Manufacturing Company of Pittsburgh, Pa., which has manufactured ceramic pigments and processed radio-active ores for many years. Officers of Vitro Chemical include W. C. Rickerson, chairman of the board (he is also chairman and president of Vitro Manufacturing); A. J. Strod, president (he is also president of VMC's uranium division); J. R. Simplot, vice president; and M. G. McGrath, vice president, who has been manager for VMC at Grand Junction, Colorado, since last fall.

Lucky Tiger Forms Company To Operate Ute-Ulay Mine

Lucky Tiger Combination Gold Mining Company of Kansas City, Missouri, has formed a subsidiary, Colorado Standard Lead-Zinc Mines, Inc., to purchase and operate the Ute and Ulay mine and mill on Henson Creek, Hinsdale County, Colorado. Lucky Tiger owns 50 percent of the stock in the new company and has advanced it more than $200,000 to start operations.

The property is equipped with a 100-ton-per-day differential flotation mill and a 600-hp. hydro-electric plant. A reported 40,000 tons of complex lead-copper-zinc sulphide ore carrying gold and silver values has been blocked out in the Ute and Ulay veins. Plans call for the mill to resume operating in the second quarter of 1951. J. B. Kassebaum, 710 Commerce Building, Kansas City, is president of Lucky Tiger.

The *American Zinc, Lead and Smelting Company* has taken a lease and option on the *Silver Ledge* mine, San Juan County, Colorado. The Silver Ledge is the only openpit lead-zinc mine in the county; American Zinc, however, expects to conduct underground operations to the third level. Marvin L. Kay, general superintendent of the American No. 1 custom mill, will also direct operations at the Silver Ledge.

The *Kentucky-Utah Mining Company* has contracted for the churn drilling of shallow prospect holes on its leased, *Blair* group of uranium-vanadium claims near Nucla, Montrose County, Colorado, according to W. D. Nebeker, Jr., president. The company is also interested in 75 claims on the eastern slope of the Henry Mountains in Garfield County, Utah.

The *Southwest Metals Company* has closed its *Mickey Breen* mine in Poughkeepsie Gulch, Ouray County, Colorado. Lead-zinc-silver-gold ores had been shipped from the mine for the past several years. Superintendent Oren Fulghum is in charge of a small maintenence crew.

The *Trand Mining & Leasing Company* is reopening the *South Burns* mine on Bull Hill in the Cripple Creek district. Roy Andrews is in charge of operations. He knows the property well as he was one of the partners in the *Jeeters & Andrews* lease, under which many thousands of tons of low grade gold ore were shipped before World War II.

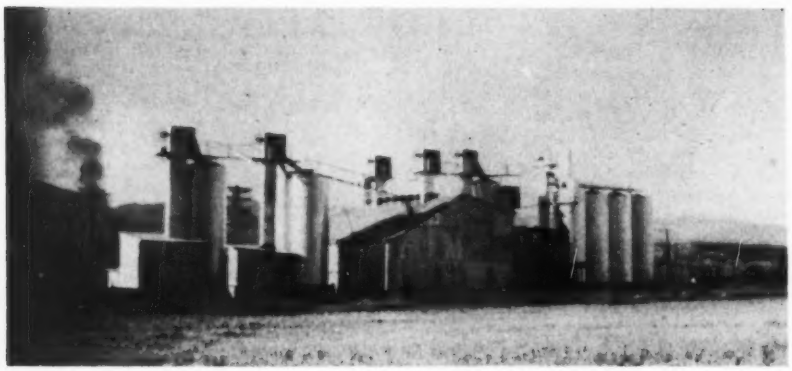
Minerals Engineering Company of Grand Junction, Colorado, is operating a uranium mine at Slick Rock, Montrose County, Colorado, under a lease from the *AEC*. The firm employs 45 men, is diamond drilling for the AEC under contract and recently invented a new type of wagon drill for shallow prospecting.

John Crim and Associates have been granted a lease by the City of Ouray, Colorado, on ground at the foot of the falls in Box Canyon and will start gold placer operations shortly. Installation of equipment is underway, and the lessees plan to divert the river and sluice the sand and silt below the falls.

The Arkansas Valley plant of the *American Smelting & Refining Company*, near Leadville, Colorado, is being remodeled and new equipment installed to facilitate handling of ore and concentrate from the Leadville-Gilman, San Juan, and Idaho Springs-Georgetown mining districts of Colorado and from Utah. A new copper-drossing plant has been installed to remove copper from lead bullion and convert it to copper matte and speiss for shipment to ASARCO's Garfield, Utah, copper smelter. A new sinter-handling system also has been finished. A new blast-furnace, slag-granulation plant is being constructed as is also a Polyclone exhaust system at the Wedge roasters. Leo Hannebach is plant superintendent and Thos. P. Fahey, assistant.

The *Clark-Mackey Development Company* is continuing development of the

WESTERN FELDSPAR CO. TO OPERATE NEW GRINDING PLANT AT SALIDA



During 1950 the Western Feldspar Company erected this 110-ton per day, dry, fine grinding feldspar mill just north of Salida, Chaffee County, Colorado. First operation of the mill is scheduled for the beginning of March, 1951. The new mill will grind soda feldspar from the Homestake quarry, operated by M. & S. Company, Inc., in the Turret mining district, 10 miles northeast of Salida. Crude feldspar is trucked from the quarry to a stockpile adjacent to the grinding mill. Ground and sized feldspar will be shipped by rail to glass and ceramic manufacturers in Illinois, Oklahoma and Texas.

Fortune and *Resurrection* mines at Leadville, Colorado. Paul Clark is manager and Harold Gilna is superintendent. Development of the *Sedalia* group of claims also is planned on a split-check basis with several other men.

Since the *Golden Cycle Corporation's* mill at Cripple Creek, Colorado, is nearly ready to open, the company is getting its *Ajax* mine in shape for resumption of mining. According to Charles Carlton, superintendent, surface work is completed, the ore house modernized to allow dumping from ore haulage trucks, and electricity turned on. The mine was closed two years ago when mill construction began.

Colorado's 1950 metal output, according to recent U. S. Bureau of Mines figures, was as follows: gold, 130,000 fine ounces; silver, 3,540,000 fine ounces; copper, 3,200 short tons; lead, 26,790 short tons; and zinc, 45,854 short tons.

UTAH

The *New Park Mining Company* has applied to the government for $250,000 to help further the company's exploration and development program at its Park City, Utah, mines, according to W. H. H. Cranmer, president. Some of the money would be used to extend the Mayflower tunnel west from the orebody and under the Star of Utah tunnel. A raise would then be driven from the Mayflower to the Wasatch lime beds running through New Park and *Park Utah Consolidated Mines Company* properties. The rest of the money would be used for two crosscuts, one to be driven north 1,500 feet from the Mayflower tunnel level through parallel fissures, and the other to be driven south 2,000 feet from the Mayflower level beyond the orebody now being mined. This program would take three years. Another request to the government is being prepared for more assistance so the company can explore the *East Utah Mining Company's* property, in which New Park has a major interest. In this mine the McHenry fissure shows promise of productivity since Park Utah has mined from other sections of it. Meanwhile New Park has advised that its new hoist has arrived and, after its installation, levels below 1,385 feet can be developed.

Extensive development in the Marysvale and Temple Mountain areas of Utah is being done by the *Magnolia Lead and Oil Company*, which recently announced that mining also has just begun on the Clearview No. 2 claim in the Temple Mountain district. A compressor and bulldozer were installed on the property and shipments will be made to Monticello. According to Ken Griffiths, secretary-treasurer, two more veins of autunite have been discovered, bringing the total to four.

Brief reports about the activities of several Utah companies have been received and include the following information: The *Chief Consolidated Mining Company* has applied to the government for funds to help deepen its inside shaft in the Chief No. 1 about 300 feet to the 3000 level, and to help in carrying out development in the Plutus, Evans and Apex sections of the property and exploration in the Water Lilly. *Dragon Consolidated Mining Company* has increased halloysite production from its Tintic mine. The clay is sent to the *Filtrol Corporation* in Salt Lake City. *Silver Standard Mining Company* has contractors at work extending its Ophir Hill tunnel. *Cardiff Mining and Milling Company* at Alta is unwatering its mine below the 1000 level and has leased the lower levels of the property for mining.

The *Little May Mining Company* has taken a one-half interest in a bond and lease on the *Blackie* group of mining claims in the Marysvale district of Utah and will prospect them for uranium. Work on adjoining properties has shown the existence of uranium, and the Little May will make a complete geological investigation before starting development. Some information also will be obtained from the government's diamond drilling work in the area. The Little May company owns 12 gold-silver-lead claims in the Golden mining district of Box Elder County and leases four adjoining claims. Shipments have been going out from some of these properties. The company also is considering further development of the Milford Lilly section of its mine in the Star mining district, Beaver County, where gold, silver, lead and copper ore exists as well as some showings of tungsten. And the Tintic property in Juab County, which has been idle for a year, may now be leased.

Reopening of the *Harrington* lead mine at Milford, Utah, by *Harrington Mines Company*, will start soon, according to James D. Williams, general manager. The company has taken a 20-year lease on the mine and several other properties in the area. The Harrington is owned by the *New Majestic Mining Company* and the agreement calls for unwatering to the 600-foot level and at least 1200 feet of development work at that level. Work will also be done on the 500 and 700 levels. Williams said that a 44,000-volt power line will be extended to the property by the Telluride Power Company. When mining begins ore will be shipped to *Combined Metals Reduction Company's* Bauer plant. Harrington Mines has arranged for an initial expenditure of $60,000 and may request government aid later on.

Senator Arthur V. Watkins of Utah is investigating the possibility of opening Utah National Monument regions for uranium exploration and prospecting. According to reports, officials of the Interior Department and the AEC are trying to seek a legal means of reaching this objective without having to resort to congressional action.

At the Colorado Mining Association, several operators remarked on the possibility of opening the *Happy Jack* mine in White Canyon, San Juan County, Utah. The mine is reported to be a good potential source of uranium-copper ore.

Utah's 1950 metal production increased by 46 percent according to John H. East, Jr., regional director of the U. S. Bureau of Mines. Production was as follows: Gold, 460,000 fine ounces; silver, 7,023,500 fine ounces; copper, 278,850 short tons; lead, 43,050 short tons; and zinc, 31,400 short tons.

R. O. Dulaney, Cortez, Colorado, and associates have formed the *White Canyon Corporation* for the prospecting and developing of copper-uranium deposits in the southwest. Of particular interest at the present time is the White Canyon district of San Juan County, Utah. Mining is scheduled to start in the near future.

Pierre Perry of Marysvale, Utah, has cleaned out the old workings at the *Blue Eagle* claims and is prospecting for uranium. Some autunite is reported to have been found in the bottom of a shaft.

Fritz Wright of Loma, Colorado, is mining uranium-vanadium ore at Temple Mountain, Emery County, Utah. A complete camp has been established at the mines and machinery installed.

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SOUTHWESTERN GEOLOGICAL SERVICE
Alfred D. Wandke Arthur R. Still
Geologic and Engineering Mapping
Prospect Examinations
Microscopical studies of ores and mill products
Box 1512 Prescott, Arizona

PRODUCTS AND SUPPLIES:

Ima Tungsten

Continued from page 13

2. Flotation of jig tailing to remove sulfides, especially silver-bearing tetrahedrite, galena, and chalcopyrite—six 36 by 36 inch, Galigher flotation cells.
3. Tabling of flotation tailing to recover fine hubnerite and scheelite, and impurities of iron, siderite, rhodochrosite—six Deister Concentrator Company No. 6 tables, and a No. 6 middling retreatment table.
4. Magnetic separation, in separate runs for the jig and table concentrates, to separate iron, rhodochrosite and siderite, hubnerite, and scheelite into separate products—a Dings Perma-pulley and a Memco-Hope, Type CB, 3-pole magnetic separator.

In the narrow confines of Patterson canyon, there is little space for tailings disposal. Tailings leave the mill, cross Patterson creek and are carried 4000 feet in a wooden flume to a sump at the mouth of Patterson canyon. At the sump, a four-inch Wemco sand pump lifts the tailings 25 feet and delivers them to the tailings-disposal area in Pahsimeroi valley.

Service and Facilities

POWER. Electrical power is generated at Ima by 3-phase, 440-volt generators—three powered by Caterpillar D-13000 Diesels and one powered by a Fairbanks-Morse 120-hp. Diesel. In the mine, 440-volt power is supplied at all level stations and at all battery-charging stations. A fifth 440-volt generator powered by a Caterpillar D-8800 Diesel is held for emergency use, but is seldom needed.

COMPRESSED AIR. Caterpillar D-13000 Diesels drive three Gardner-Denver HAC 15½-&-9½ by 10 compressors which supply a maximum flow of approximately 1500 cfm. of air. Compressed air is piped to the Zero portal by a 4-inch line, to the 360 by a 2½-inch line; lines on the Zero and 360 are interconnected. Receivers, averaging approximately 50 cubic feet of volume, are installed at 10 points of distribution in the mine.

DRILLING WATER. Mine water is caught in a sump on the Zero level, pumped from the sump into a tank and forced from the tank throughout the mine by compressed air injected into the tank.

VENTILATION. The Zero level, interconnecting workings and 360 level form a natural ventilation circuit. In the summer, air flows into the Zero and out the 360; in the winter it flows in a reverse direction.

Tungsten For Defense

Bradley's Ima operation represents the kind of strategic-metal producer that provides its products when they are vitally needed and with a minimum of economic waste. Acquired near the end of World War II, explored and developed for more efficient production during a slack peacetime period, and equipped with a new mill during peacetime, Ima is well described in Manager Charles Hathhorn's statement, made at the beginning of the Korean war, that, "We're sitting here on a springboard, ready to dive into action as soon as there's a demand for tungsten." That demand followed shortly upon Mr. Hathhorn's statement, and Ima could and did "dive into action," producing vitally needed tungsten for our industrial and war machines.

DRILLING COMPANIES:

RECONDITIONED AND GUARANTEED MINING AND MILLING MACHINERY

CONCENTRATING TABLES

—#6 Wilfleys, enclosed head motions, rubber deck covering
—Deisters, rubber deck coverings
—Butchart, rubber deck coverings

CRUSHERS

1—9" x 40" Austin-Western
1—10" x 20" Allis-Chalmers Blake
1—8" x 10" Blake
1—8" x 10" McClair—Jaw

FLOTATION MACHINES

2—No. 24 Denver "Sub-A" with wood tanks, rubber impellers

DIESEL GENERATORS

1—D-4400 Caterpillar V-belted to a 30 KVA 220 volt Fairbanks-Morse AC Generator. Complete with switchboard

HOISTS

1—3-Drum I.R. Slusher, with built-in 50 HP AC Motor
1—#21½ Vulcan Single Drum, direct geared to a U-6 International Gas Power Unit
1—#6½ Vulcan, single drum
1—Box Iron Works Single Drum, direct geared to a 15 HP Slip-ring Motor
1—H&B Single Drum Converted, direct geared to a 25 HP Slip-ring Motor
1—Crow Converted Single Drum Friction direct geared to a 7½ HP Slip-ring Motor

PUMPS—SAND

1—2" Split Case Wilfley Pump—rubber lined—motorized
3—2" Wilfley Pumps—solid bowls—rubber lined—motorized
4—2" Wilfley Pumps—motorized
1—2" Kimball-Krogh

FILTERS

1—4', 6-disc Eimco, with vacuum equipment—new sectors and sector bags

CLASSIFIERS

1—6' x 22' Dorr Type Duplex Rake Classifier
1—60" x 23' Denver Equipment Simplex Crossflow, Spiral Classifier

THICKENERS—CONDITIONERS STEEL "A" FRAMES

1—16' x 10' Dorr Thickener—wood tank—steel superstructure, complete with motor and diap. pump
1—6' x 5' Conditioner—steel tank—motorized
2—Steel "A" Frames on 10' x 9' Agitators, with 20 HP Vertical Motors
5—Steel "A" Frames only for 6' x 8' Conditioners, with 15 HP Vertical Motors—no tanks.

MISCELLANEOUS

1—30" x 48" Baker Ball Mill
1—3' x 3' Ball Mill
1—Bucket Elev. 30' centers, steel frame
1—20 HP Upright Boiler
1—12" x 18" Duplex Hartz Jig
1—12" x 30" Suspension Type Jeffrey Vibrator Feeder
25—Tons 85# Relayers
1150'—3" Std. Blk. Pipe
1—Drag-chain Concentrate Loader—37' ctrs.
Deep Well, Centrifugal and Piston Pumps
Auto. Samplers and Sample Cutters
Enclosed Safety Switches—Elec. Wiring
Wall Telephones—Motors—AC and DC
Dry and Wet Reagent Feeders
Belt and Flight Conveyors
1—Aerial Tramway 3200' long

WRITE FOR BULLETIN NO. 10

FLORENCE MACHINERY & SUPPLY COMPANY

Suite 904 Equitable Bldg. **C. J. PARRISH, *Manager*** **Denver 2, Colorado**

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1—5½' Symons standard cone crusher, fine bowl.
1—Each 2' and 3' standard Symons cones.
1—5'x4' Colorado ball mill.
1—48x60 Farrel Bacon jaw crusher.
1—5'x20' rotary drier.
1—10x20 Champion jaw crusher.
1—27" Simplex classifier.
1—2" Wilfley sand pump.
1—Mine hoist, Ottumwa single drum. 10,000# pull, 800 FPM, 1500 ft. cage travel. Requires 200-250 HP motor. As is near Butte, Montana —$1250.00.
1—87 HP Caterpillar diesel engine.
1—4'x8' Kennedy Van Saun air swept ball mill.
1—Tunnel mucker, G.D. model 9-H.
1—300 HP 360 RPM 440 Volt GE electric motor with starting compensator.

WASHINGTON MACHINERY & STORAGE CO.
7329 East Marginal Way
Seattle 8, Washington

MACHINERY

Thickener: 40x8 ft. Dorr
Magnetic Pulley: 15x21 with m.g. set
Jig: Bendelari 36x36 duplex
Flotation: 4 Fag Sells 44x44
Mill: Marcy 6x6, syn. motor 440-v.
Milling Plant: 6x6 A-C mill; Dorr classifier; American filter, etc. bolted steel bldg. All A-1.
Crusher: 10x20 Allis-Ch.
Headframe: 60 ft. 3-comp. bolted steel
Loaders: Eimco 12-B 18 or 24" ga.
Apron Steel Feeders: 24" wide.
Transformers: (3) 23,000/11000-460/230 Allis-Ch. 200 kva.
Flotation: 6-Cells 32x32 Sub.-A.

PAUL F. SMITH
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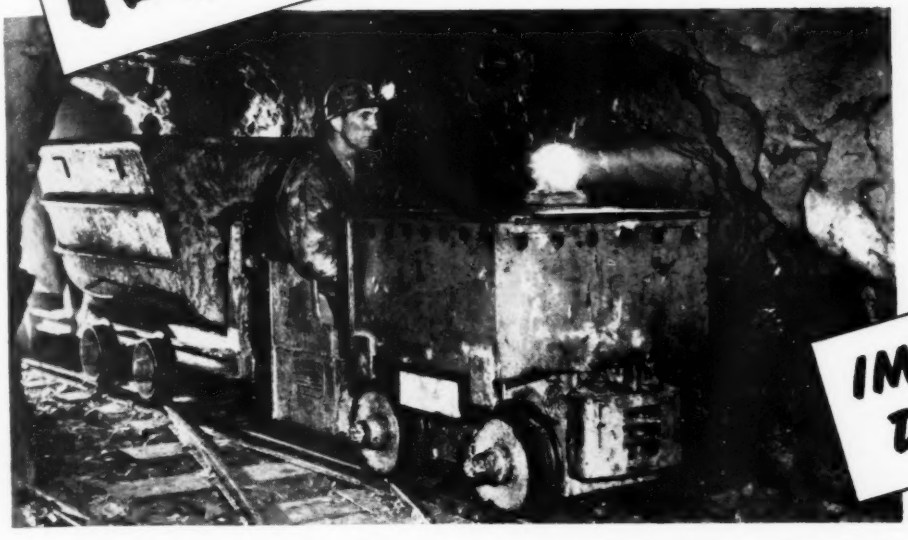

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Compact—Folding feature permits loading on mine elevator cage. Small over-all dimensions for work in limited space.

Easy to Maintain—Rugged, simplified construction reduces out-of-service time.

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Type—LSB—1C1—½	
Weight—rated	3000 lb
Per driving axle	1500 lb
Track gage	18-24 in.
Width	36 9/16 in.
Length over bumpers	71½ in.
Height over-all	
standard battery	38⅛ in.
high type battery	44⅛ in.
Wheel base	27 11/16 in.
Wheel diameter	14 in.
Minimum curve radius, locomotive alone	8 ft.
Performance Data	
Maximum drawbar pull	750 lb
Rated drawbar pull	400 lb
Maximum speed (locomotive alone)	7 mph
Speed at rated dbp	3 mph
Rated voltage	40 volts

Drawbar pull values are based on level tangent track in such condition that required adhesion may be obtained.

For complete information, contact your nearby G-E representative. Apparatus Dept., General Electric Company, Schenectady 5, New York.

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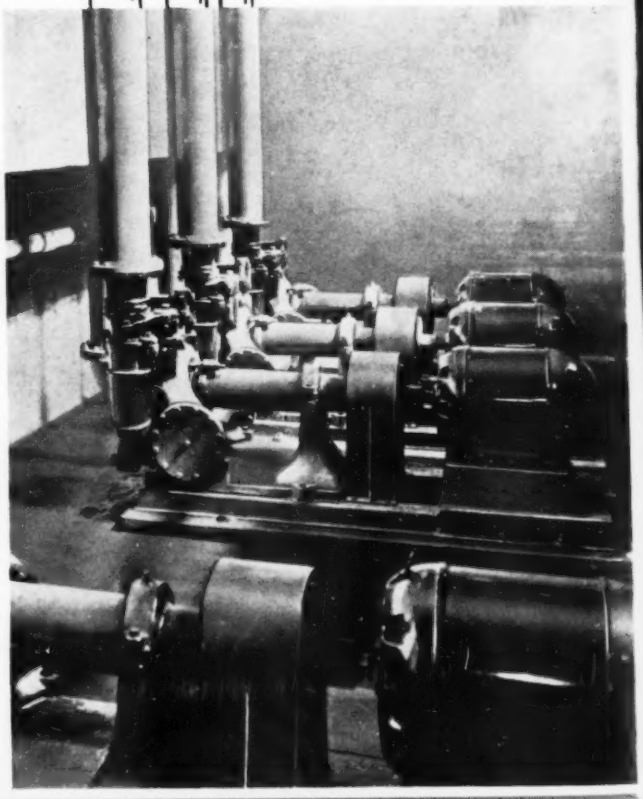

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